A STUDY OF DIAGNOSTIC LAPAROSCOPY

IN CHRONIC ABDOMINAL CONDITIONS

DISSERTATION SUBMITTED FOR THE DEGREE OF

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BONAFIDE CERTIFICATE

This is to certify that the dissertation entitled **" A STUDY OF DIAGNOSTIC LAPAROSCOPY IN CHRONIC ABDOMINAL CONDITIONS"** is a bonafide record work done by **Dr.S.ANURADHA** under my direct supervision and guidance, submitted to the Tamil Nadu Dr. M.G.R. Medical University in partial fulfillment of University regulation for M.S. General Surgery, Branch I during the period of November 2007 – November 2009.

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I **Dr. S. ANURADHA** solemnly declare that the dissertation titled **"A STUDY OF DIAGNOSTIC LAPAROSCOPY IN CHRONIC ABDOMINAL CONDITIONS"** has been prepared by me. I also declare that this bonafide work or a part of this work was not submitted by me or any other for any award, degree, diploma to any other University board either in India or abroad.

This is submitted to The Tamilnadu Dr. M. G. R. Medical University, Chennai in partial fulfillment of the rules and regulation for the award of M.S.(General Surgery) Branch – I to be held in March 2010.

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CONTENTS

INTRODUCTION

Many surgeons worldwide have had the challenging experience of facing an unexplainable abdominal pain and uncertain diagnosis or staging of intra abdominal neoplasias.

History taking, physical examinations, laboratory tests and sequences of advanced noninvasive imaging studies might provide some help, but are often insufficient for accurate diagnosis.

A number of times, imaging studies can not provide an accurate diagnosis of the aforementioned abdominal conditions. Nevertheless, exploratory laparotomy has inevitably been undertaken for those who have no definite diagnosis even though every modality has been tried.

A more accurate less invasive and good diagnostic method is needed to fulfill such multipurpose demands.

Hence diagnostic laparoscopy is indicated in any situation when inspection of abdominal and pelvic organs will help to establish a diagnosis and to define subsequent management.

AIM OF THE STUDY

A study of diagnostic laparoscopy in chronic abdominal conditions in which diagnosis could not be revealed with available modalities of investigations with equivocal findings to assess the operability and for staging.

HISTORY

- The use of diagnostic laparoscopy has evolved over the last decade and is now considered an integral component of the diagnostic and staging workup of many benign and malignant conditions, its not a new concept.
- The instruments that help in the visualization of the body`s inner aspect were used as early as the days of Hippocrates and ancient Romans. A three bladed vaginal speculum, which is very similar to the modern day vaginal speculum, was found in the Pompeii`s ruins(70 AD) from ancient Rome.
- Philip Bozzini of Vienna, Austria (1805), designed the first modern day endoscope,``LICHTLEITER" (Light conductor) that overcame the deficiencies of these systems by transmitting light into the body of the individual.
- Maximillan Nitze developed a cystoscope with a series of lenses and platinum wire as a light source and reported it in 1879.
- The problem of light source remained a major obstacle till the introduction of miniaturized incandescent light source by Newman of Glasgow in 1883, just four years after its invention by Thomas Alva Edison.

- George Killing, the German surgeon from Dersden was first to use the cystoscope in a living dog in the Seventy third congress of German Naturalists and Physicians in Hamburg in 1901.
- Laparoscopic examination of the abdominal cavity in humans was subsequently described in 1910 by Jacobeus, a Swedish physician, published the results of a 97-patients series performed between 1910 and 1912 at Stockholm's community hospital.
- The first reported laparoscopic examination(1991) in the United states is credited to Bertram Bernheim of the Johns Hopkins University; he performed a procedure he termed organoscopy of two patients, one of whom was a patient of W.S.Halstead and was found to have advanced pancreatic malignancy.
- Boesh, the Swedish surgeon performed the first laparoscopic tubal ligation with electrocoagulation in 1936.
- In 1938, John Veress developed a spring loaded needle for creation of pneumothorax in patients with tuberculosis.
- Raoul Palmer, the French surgeon from Paris in 1940s, conceived the importance of continuous intraabdominal pressure monitoring during pneumoperitoneum and the use of gravity to assist in retraction.
- The 1950s saw two major changes in endoscopic technology, the cold light and the Hopkins Rod lens system.

- The Rod lens system invented by Hopkins in 1953 was a major shift from the prevailing endoscopes with long air segments in between.
- Hasson from Chicago, USA published a report on 1971 about his alternative and safe access by a minilaparotomy using a specially designed cannula with an olive shaped sleeve that was used to anchor the trocar to the rectus sheath.
- The first half of 1980s saw the introduction of technology that helped in fuelling the growth of minimal access surgery to what it is today.
- Kurt Semm did the first laparoscopic appendicectomy during a routine gynaecological procedure in 1983.
- Charles Fillipi and Fred Mall performed the first laparoscopic cholecystectomy in dogs in 1985. Phili Mouret claimed to have performed the first laparoscopic Cholecystectomy in 1987 at Lyon in France but did not publish this feat.
- World congress of Digestive surgery held at New Delhi in October 1990 by which Dr. C.Palanivelu was impressed and established the Coimbatore Institute of Gastrointestinal Endosurgery(CIGES) in India in 1991, which was the first laparoscopic gastrointestinal centre in south india.

DIAGNOSTIC LAPAROSCOPY

Indications

Diagnostic Laparoscopy has been used in both benign and malignant Conditions.

Benign

a) Acute abdominal pain

Intestinal ischemia,Bowel obstruction, Perforated viscus, Acute right lower quadrant pain due to gastro intestinal and gynaecological causes.

b) Chronic abdominal pain

Post operative adhesions,Abdominal tuberculosis, Mesenteric adenitis, Appendicial abnormalities, Fitz- Hugh-Curtis syndrome, Hernia, Endometrosis, Ovarian abnormalities and malignancy

c) Infertility

d) Blunt or penetrating abdominal trauma

e) Liver disease and Ascites

Malignant

a) Stage intra-abdominal malignancy -

Oesophagial, Gastric, Peripancreatic, Hepatic (primary and secondary) Colonic,Ovarian,Lymphoma

b) Neo-adjuvant and adjuvant therapies/obtain tissue for diagnosis

Contraindications for diagnostic laparoscopy

Absolute Contraindications : Known Diaphragmatic hernia.

Hemodynamic instability.

Relative Contraindications

Contraindications	Possible Risk.
Previous Surgery	Adhesions leading to visceral injuries.
Intra-abdominal sepsis	Friable bowel prone to injury
Bowel Obstruction	Friable bowel prone to injury
Morbid Obesity	Difficult access, requirement for longer instruments,increased intra abdominal pressure.
Pregnancy	Injury to gravid uterus
Aneurysmal disease	Vascular injury.
Cardio-pulmonary compromise	Raised intraabdominal pressure may significantly reduce the cardiac preload Carbon dioxide insufflation may result in Carbon dioxide retention.

Approach to diagnostic laparoscopy

Imaging systems

The basis of video imaging systems include the telescope, camera, light cable, light source and the monitor.

The camera

The camera forms the most important and vital part of the imaging system. Charge-coupled cameras are widely used, contains silicon wafers which are divided into multiple tiny sensors called pixels. Single chip – 450 lines, Three chip – 700 to 800 lines, high definition – 1000 lines. All these cameras need white balancing before introduction into the abdomen to get a true color image of the internal organs.

Laparoscope

The british physicist, Hopkins invented the present day laparoscope in 1952.The present day laparoscopes have a series of rod lens in the centre (Rod Hopkins system) with a rim of optical fibres on the outer aspect. The optical fibres carry the light into the abdominal cavity and the rods lens system transmits the image from the abdomen to the camera.

Various types of laparoscopes have been designed based on the size and angle of vision. Routinely used 10mm scopes offer excellent clarity and resolution. The forward viewing laparoscope(0`) is used by some surgeons for all procedures. The angled view scopes(30` / 45`) provide a flexible field of vision when compared to the forward viewing scopes.

Light Sources

The light sources are the vital equipment that help in producing images with bright and even illumination. There are two types of light sources, the halogen and xenon.

Halogen lamps are economical and are sufficient for basic laparoscopic surgeries. Xenon 300watts lamp produces an intense image of light that closely approximates that of the sun and is currently considered the standard light source for laparoscopic surgeries. A cold light fountain with a 250watts halogen lamp is essential.

Light cables

The light is transmitted from the light source to the area of dissection through the light cable and the fibre bundle in the laparoscope. They are of two types, the fluid filled cables and fibreoptic cables.

Monitor

The monitors are the final limb of the imaging chain. It should be located infront of the surgeon in a gaze down view. The quality of the monitor is essential for adequate quality of the image. The high resolution medical monitors with multiple inputs are ideal for advanced laparoscopic surgeries with resolution of more than 1600 lines to achieve optimal image presentation. Some monitors are designed to receive either a composite video signal or the higher quality Y/C or RGB signals. The type of signal received is determined by the signal output of the camera box.

Insufflator

The working space can be created by either pneumoperitonuem or by abdominal lift systems. The intraabdominal pressure must be maintained at 12-14mm mercury. The insufflation devices should be capable of delivering atleast 10litres/min when performing major surgeries.

Suction and irrigation apparatus

Irrigation and aspiration are important during laparoscopic procedures, particularly for maintenance of clear visual fields and hemostasis. There are two types of apparatus, the roller pump type pushes the irrigating fluid through the tubing with the help of motorized rollers. The other type of apparatus increases the pressure in the irrigation fluid reservoir with the help of motorized pumps. The increased pressure in the reservoir pushes the fluid through the tubes.

Electrosurgical Instruments

The ability to coagulate tissues to prevent or control bleeding is one of the prerequisites of any surgical procedure. Facility to use both monopolar and bipolar current is essential. Some laproscopists prefer thermocoagulation on the grounds of safety and, possibly, less tissue dissection.

Electrosurgical units are machines which produce an alternating electrical current at a frequency which will not stimulate neuromuscular activity. Direct current flows in one direction only, but alternating current flows

to and fro in both directions, producing a sinusoidal wave from. A pure cutting current is a simple sinusoidal wave from. Because it is continuous it does not need to be at high power. If the point of application is small, the power setting may be low. Thus a cutting current applied through a microneedle provides an instrument capable of incising tissues with safety because the power at the point of impacts is low.

Veress Needle

The Veress needle is the most commonly used needle to induce pneumoperitoneum. This has a spring loaded blunt tip that is retractable into a sharp teeth available as disposable/non disposable. Low flow rate 1litre/min and high flow rate 2 -2.5 liter/min, connected pressure should be less than 3mm of mercury.Pressure more 3 indicates blockage in tube/hub/shaft. Maximum flow rate through Veress needle -2.5L/min

Types of Veress needle

- Disposable - One piece, plastic design, length 7- 12 cm,

- Non disposable - Inner tube with blunt tip, outer sheath with sharp edge.

Can be disassembled

Patency of veress needle is checked by flushing saline for leak by occluding the tip and push fluid under moderate pressure. By pushing the blunt tip against a solid flat surface, it should retract freely.

Palmer Test

The palmer test was developed to determine if the umbilicus was free of adhesions or bowel from previous surgery. The insufflation needle is placed in the left lateral position and the abdomen is filled with carbondioxide. A syringe half filled with fluid is attached to an 18 gauge needle which is inserted through the umbilicus. The pressure of the insufflated carbondioxide pushes the syringe up. The syringe is aspirated.

- Pure gas indicated the area is free to intestine
- Blood or no aspirate indicated adhesions
- Cloudy liquid indicates bowel

The test can be repeated in multiple areas until gas is aspirated. The trocar can then be inserted through this location into the abdomen.

Trocars and Cannulae

The trocars serve as the pathway to the abdominal cavity through which various instruments are introduced. Hasson`s cannula consists of three pieces , a cone shaped sleeve,a metal or plastic sheath with a trumpet or flap valve, and a blunt tipped obturator.

Laparoscopic space access

Pneumoperitoneum is created by closed method by using Veress needle and open method by using Hasson`s cannula.

Port placement

- Manipulation angle of 60 degree
- Equal azimuth angle
- Elevation angle of 60 degree
- Intra : extra corporeal shaft ratio of 2:1

Laparoscopic instruments

The main difference between conventional and laparoscopic instruments is the presence of long shafts and the attached hand grip. The effector retains the same basic design as the conventional instruments. These instruments are usually around 33cms long for its effective reach in the abdominal cavity.

Hand grips : The handles should be designed ergonomically so that there should be minimal discomfort during handling the instruments. Ring and shank handles are the commonest type of handle grips that are used for one handed manipulation during dissection,cutting and other manoeuvres.The pistol handles allow integration of several different functions because of the hand volume.

Instruments and their practical use

Instrument type	Use
Dissectors	Basic instrument for dissection, either single action or double action jaws.
Maryland	
Curved dissector with long blades	Dissection
Blunt dissector,Grasper	Aids during dissection with Maryland
Grasper	For retraction and extraction of gall bladder.
Scissors	Dissection,division of cystic duct, vascular pedicle during ligation
Curved metzenbaum	
Straight scissors	Division of suture material
Allis(10mm) & Babcock	Retraction of large bowel, stomach
Spatula	Manipulation of small bowel during diagnostic laparoscopy
Bowel holding(short & Long)	
Retractors	For retraction of small bowel and left lobe of liver
10mm disposable	
Biopsy forceps 5mm	For peritoneal and liver biopsy
Suction nozzle	Suction and irrigation, also used as finger for blunt Dissection
5mm,stainless, toggle Mode,Finger manipulation	
Needle holder	

Ethicon type 5mm, 3mm	For endosuturing and knotting
Veress needle	Introduction of pneumoperitoneum and Pneumothorax.
Clip applicators	Occlusion of cystic duct and artery Occlusion of veins
10mm reusable	
5mm reusable	Used to clip the small vessels
Loop applicator	For application of endoloops
3mm applicator	

Sterlization of instruments

Sterlization of camera head and cable unit may be performed in several ways and depends ultimately on the manufacturer`s recommendations. The options are gas sterilization (e.g, ethylene oxide),soaking in a disinfectant such as cidex or 100% alcohol,using one of the commercially available chemical sterilization (eg ., the Steris system,which is a portable sterilization unit that uses peroxyacetic acid, steam, and pressure to sterlize a camera unit in 30 minutes),or not sterilizing the camera, but merely covering it with a sterile plastic drape during use.

Complications

- Pneumoperitoneum related gas embolism, cardiovascular complications, Subcutaneous emphysema
- Access related and Intra operative vascular injuries, Gastro intestinal injuries, Urinary tract injuries, visceral injuries
- Electro surgical injuries
- Post operative - Pain,nausea & vomitting,deep vein thrombosis ,pulmonary embolism,incisional hernia

Advantages of laparoscopy

Shorter hospital stay, rapid post op recovery, less immunological and metabolic disturbances, Less wound related complications, Better cosmesis and economically sound

Disadvantages

Mechanical restriction

- Limited degree of freedom of movement,
- Diminished tactile feedback, Small and long instrument,
- Problems of organ retrieval and inversion and multiplication

Visual limitations

- Two dimensional imaging,
- Reduced field of endoscopic vision,
- Endoscopic tissue spatial relation,
- Quality of video endoscopic system

LAPAROSCOPIC TECHNIQUE

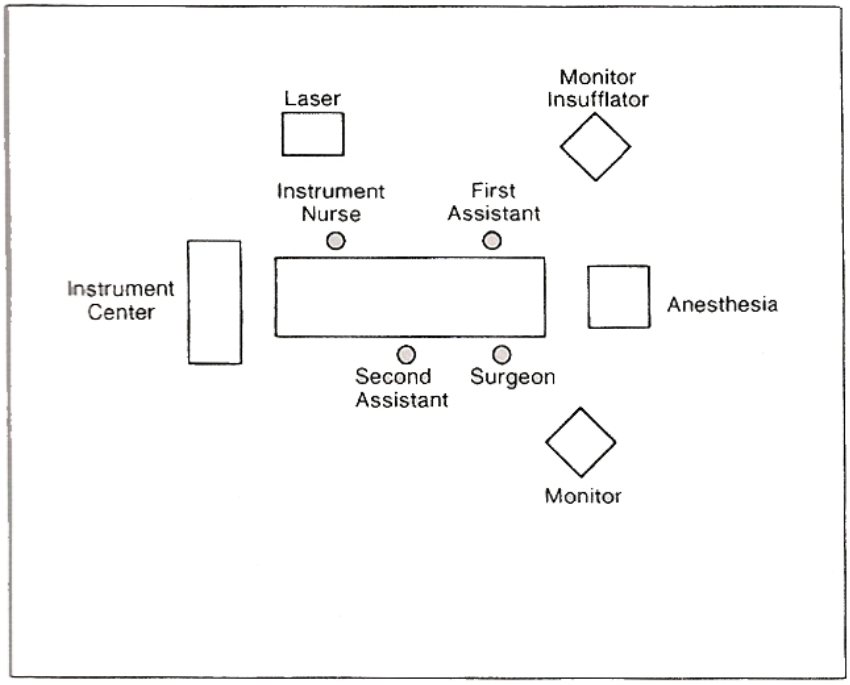
1) Pre-operative check list

Before the patient is brought into the operating room, the surgeon must ensure that the insufflator is functioning and has an adequate supply of gas and that the electric generator. light source and video equipment are all in perfect working order. Once the patient has been anaesthetized and prepared, the surgeon should also be assured that all the equipment necessary for the performance of the operation is present and functioning. Nothing is more frustrating than to discover that the light cable is not compatible with the light post or the telescope or that incorrect electrical leads have been provided.

2) Anaesthesia

A general anaesthetic with muscle relaxation, endotracheal intubation and assisted respiration should be administered. Relaxation of the abdominal muscles greatly facilitates the introduction and manipulation of the instruments. Laparoscopy with carbon dioxide carries a risk of hypercarbia. Absorption of CO_2 and splinting of the diaphragm both by the pressure of the pneumoperitoneum and the necessity of placing the patient in the Trendelenburg position aggravate this risk. It is for this reason that endotracheal intubation and assisted respiration, continuous monitoring of the heart rate, blood pressure and blood gases are mandatory.

LOCATION OF EQUIPMENT



3) **Positioning of the Patient**

The operating table should be capable of tilting in both axes. Normally diagnostic laparoscopy only requires a 15^{o} Trendelenburg tilt but a steeper angle may be used for some operative procedures. Lateral tilting helps to expose the pelvic side walls and with modern laparoscopic surgery including operations on the ureters,kidneys and spleen,as well as the gall bladder and pelvic organs, the need for a lateral tilt becomes important.

The patient should be placed in the supine position with the legs abducted and supported in a modified lithotomy position.Diagnostic laparoscopy may be performed with the legs flexed to 45^{o} but the legs should be almost flat during laparoscopic pelvic surgery to allow the full range of movements of instruments such as scissors and forceps.

4) Preparation for laparoscopy

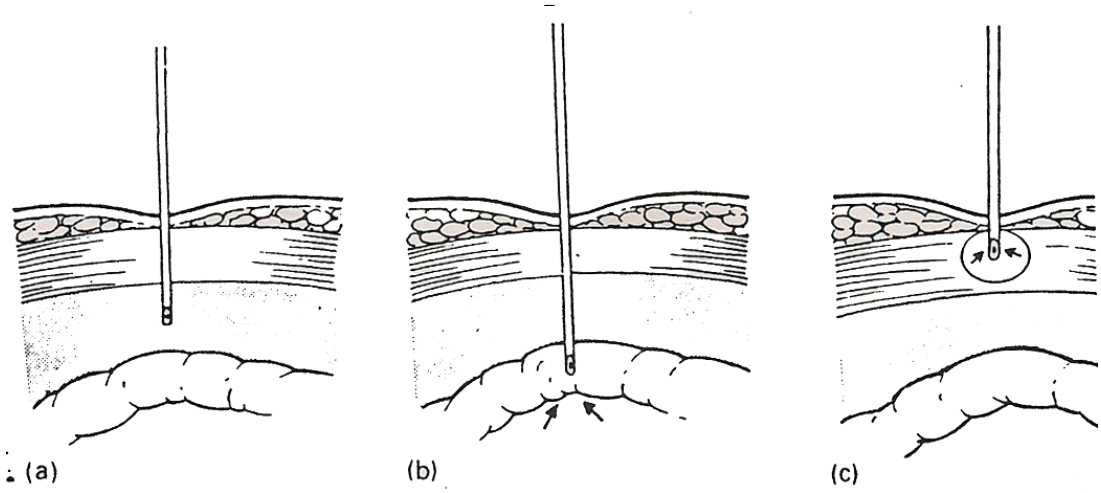
The abdominal wall should be cleansed with an antiseptic solution paying special attention to the umbilicus. At the same time, an assistant should wash the vulva and vagina, catheterize the bladder and apply a tenaculum to the cervix and insert a uterine cannula. This cannula should be sufficiently long to reach the uterine fundus, to allow effective manipulation of the uterus and should have the capability for performing chromopertubation.

5) Insertion of Veress needle

The surgeon should first check that the Veress' needle is patent and its spring mechanism is functioning. It should be connected to the pneumoflator and the gas turned on so that the basal pressure in the system can be noted. Insufflation pressure should not rise more than 5-10 mmHg above this pressure. The site of insertion must be chosen. The optimum site is deep,in the umbilicus because:

- The abdominal wall is thinnest in that position and is made up of skin, fascia and peritoneum with no intervening fat.
- The peritoneum is closely applied to the underlying fascia and does not peel off as it does in other sites.
- The incision is cosmetic and is often invisible within 2 – 3 weeks.

POSITION OF VERESS NEEDLE



a – correctly placed

b – in the bowel loop

c – in the abdominal wall

Other alternative sites are lateral to the umbilicus at the same level, supra-pubically in the mid-line or possibly better in the left hypochondrium or posterior vaginal fornix.

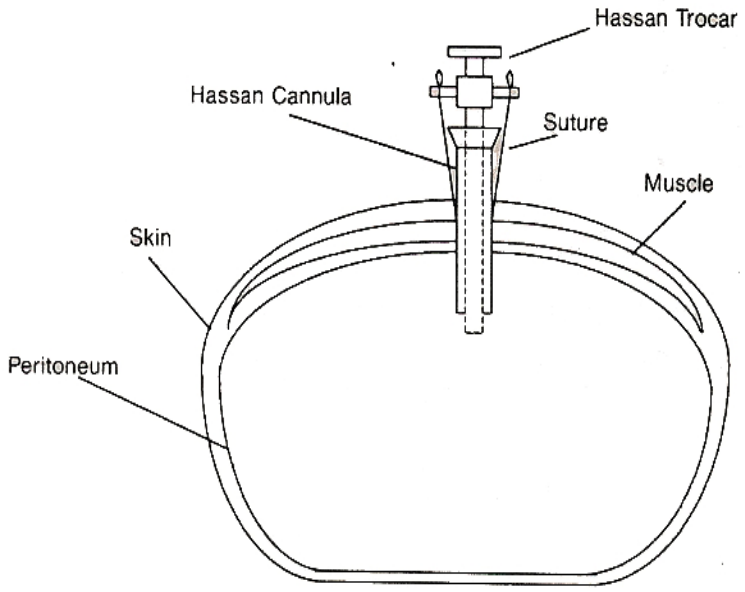
The technique of needle insertion through the umbilicus is as follows

- A small incision should be made in the depth of the umbilicus.
- The abdominal wall should be held up with the free hand to prevent damage to underlying viscera and deep vessels.
- The needle should be held by the milled ring in such a way that the blunt inner obturator can move freely. It is inserted into the incision.

The hub of the needle will be seen to move backwards as the resistance of the abdominal wall is met and will move rapidly forwards accompanied by an audible click as it pierces the fascia and again as it enters the peritoneal cavity.

- When the tip of the needle has been confirmed to be correctly situated in the peritoneal cavity, the pneumoperitoneum may be induced by insufflating carbondioxide initially at 1L/minute and, when free flow is established and the intra-abdominal pressure is below 15 mmHg, the rate may be increased to 2L/minute.
- When the pneumoperitoneum is established, the presence of sufficient Intra-abdominal space into which the laparoscope can be inserted safely should be confirmed by the sounding test.

OPEN LAPAROSCOPY



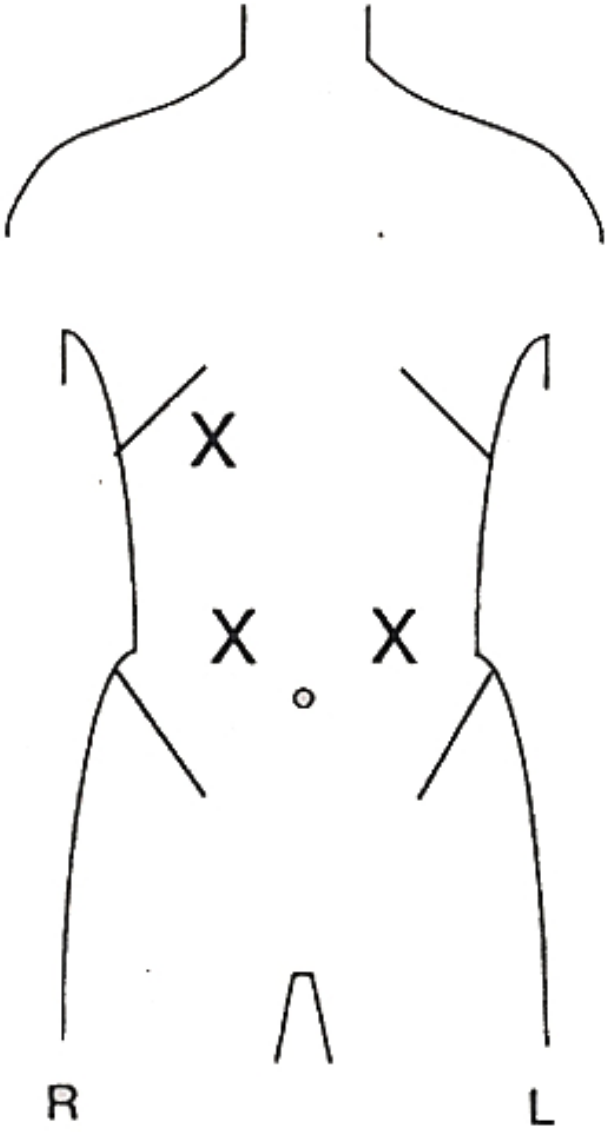
Creation of pneumoperitoneum

Insufflating agents

Ideal insufflating agent should be colourless,physiologically inert,non explosive and should have low tissue solubility and high blood solubility. It should be readily available, inexpensive and non toxic

- Air - abandoned now due to the risk of air embolism
- Carbon Dioxide - Most commonly used, naturally formed in tissues and eliminated in lungs. The advantages are non combustible with a low risk of venous air embolism(0.0016%-0.13%).The disadvantages are hypercarbia and acidosis.
- Nitrous oxide - Used for procedures performed under local anesthesia and in patients with respiratory disease undergoing longer procedures.The advantages are that it decreases pain and there is insignificant change in acid base balance. The disadvantages are it supports combustion.
- Helium- is non combustible. It is less soluble in water than carbondioxide but more diffusible. The advantages are minimal effect on acid base balance. The disadvantages are postoperative subcutaneous emphysema and there is risk of venous gas embolism.
- Argon - its low solubility which has limited use. Advantages are stable acid base status and non combustible. Disadvantages are cardiac decompression.

ALTERNATE INSUFFLATION SITES



6) Insertion of primary trocar and cannula

The primary trocar and cannula through which the laparoscope is introduced must now be inserted. A vertical incision is made through the skin from the small Veress needle incision vertically towards the lower

border of the umbilicus.The length of the incision will depend on the diameter of the laparoscope.The trocar and cannula is then held firmly with the flattened proximal end of the trocar in the heel of the hand.During insertion the upper abdominal wall should be compressed by the free hand to make the lower abdomen tense and give a firm platform against which to insert the trocar and cannula.The trocar should be advanced along a zig-zag path to prevent incisional hernia and the extended forefinger should act as a guard to prevent sudden deep insertion.

7) Insertion of laparoscope

The choice of laparoscope for diagnostic purposes is debatable. A 5mm telescope may be inserted through the umbilicus without leaving any scar and may be satisfactory for simple examination of the pelvis. However a larger telescope is preferable if video is used, as the available light allows a more detailed examination. In addition, if operative laparoscopy becomes necessary, the smaller telescope does not give sufficient light or field of vision.When the trocar has been inserted and gas heard to escape through the cannula which confirms the tip is in the peritoneal cavity, a warmed telescope to which a camera has been attached may be introduced into the cannula and advanced .

8) Insertion of secondary trocars and cannulae under vision

During laparoscopy it may be necessary to insert second or third

portals, the sites of which includes the midline about 4cm above the pubic symphysis,within the safety triangle which is formed by the umbilicus at its apex, the two obliterated umbilical arteries laterally and the pubic symphysis as its base.If these sites are inappropriate or if there are adhesions making them unsafe, the secondary portal may be inserted lateral to the rectus abdominis on either side.

9) Systematic inspection of the abdominal and pelvic organs

It is important that the inspection of the abdominal and pelvic organs is performed in a thorough and systematic manner,

The upper abdomen

The upper abdominal organs should be inspected in detail first before concentrating on the gynaecological examination. Following insertion of the laparoscope, the telescope should be rotated and the caecum and appendix examined using a probe or forceps to, retract the caecum and expose the full length of the appendix. The ascending colon is examined as far as the hepatic flexure. The presence of adhesions may indicate previous appendicular or gall bladder disease. It may be necessary to alter the Trendelenburg tilt to obtain a good view of the upper abdominal organs. The right lobe of the liver and the gall bladder should now be inspected and sub-diaphragmatic adhesions(Fitz-Hugh-Curtis syndrome) sought.The telescope should be partially withdrawn to negotiate the ligamentum falciparum,and the left lobe of liver,anterior surface of the stomach and the

spleen.The examination of the upper abdomen is completed by further rotating the telescope to inspect the descending colon, using the forceps or probe to, palpate the consistency of the bowel if diverticular disease is suspected.In this case the usual soft,mobile bowel may be more firm and less mobile.The general examination is completed by observing the sigmoid colon, looking especially for evidence of diverticular disease which may be suspected by the presence of adhesions and an alterered consistency of the colon.

The pelvic organs

When the inspection of the upper abdomen is complete attention should be given to the pelvic organs which should also be examined in a systematic manner. It is good practice to start with the uterus and then proceed from the anterior cul-de-sac in a clockwise direction round the pelvis to ensure that a full examination has been made.

10) Diagnostic procedures

- Biopsy - The role of laparoscopy for biopsy is reserved primarily for patients in whom a tissue diagnosis is required but cannot be obtained by conventional image-guided or endoscopic means.The liver and peritoneal surfaces are readily accessible. Other sites such as the retroperitoneum, lesser sac, and pelvis may require further dissection for safe exposure. Peritoneal washing can also be obtained.

- Aspiration - Laparoscopy may prove helpful, especially when the ascites is secondary to tuberculosis or carcinomatosis and the etiology of ascites remains elusive.
- Tube testing – Tubal patency is tested by chromotubation by using dilute methylene blue (1 : 20 solution). Tubal patency is often required to detect cause of infertility in female of reproductive age group
- Staging - Laparoscopy can be useful in helping to stage several malignancies, including lymphoma, pancreatic, gastric and esophageal cancer.

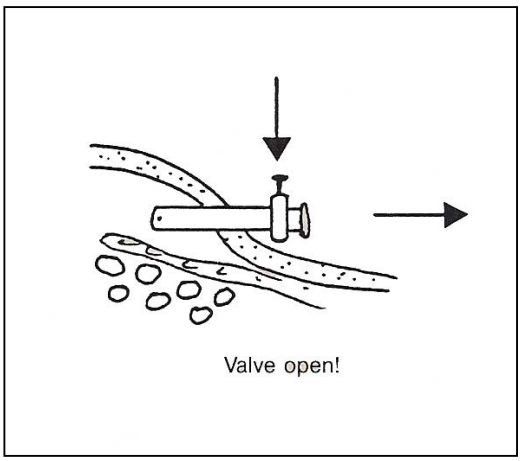
11) Removal of secondary trocars

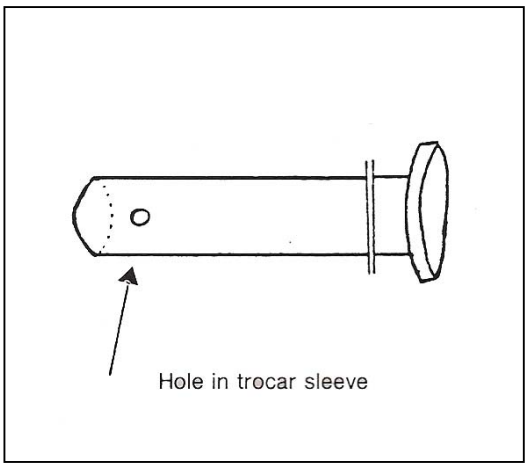
Before removing the secondary trocars the abdomen is inspected carefully for bleeding or visceral injuries. All cannulas except the one for the laparoscope should be removed under direct observation.

12) Deflation of Carbon dioxide

When the patient is still in Trendelenburg,with the sleeve of the trocar parallel to the anterior abdominal wall, retrieve the first puncture trocar while holding the valve in the open position.When the valve is closed and the end of the trocar sleeve is in close contact with small bowel or omentum, a vacuum is created that sucks the bowel into the sleeve. During retrieval of the trocar, the bowel will be pulled through the fascia. This can result in necrosis and subsequent occlusion.

DEFLATION OF CARBONDIOXIDE





Note : Hole in trocar sleeve prevents the creation of vaccum during retrieval and adds to the safety of procedure

13) Removal of primary trocar

14) Port site closure

Cannula sites larger than 5mm should be closed to prevent hernia formation. For maximum effectiveness, the suture must be full thickness which includes fascia, muscle and peritoneum.

In one technique, the needle is driven in to the abdomen, grabbed by an instrument introduced through the wound being closed and pulled outside. The needle end is threaded on the other end of the suture and is then driven through the other edge of the into the abdomen, and it is pulled out like the first one.

Both needles are then removed, and the ends of the suture are tied thus dropping the knot in the abdomen. The loop is then rotated to pull the knot out through one side of the wound. The knot is cut out and the suture retied to close the wound securely with the knot on the outside.

A Keith needle or other needle with large turning radius can also be used to traverse the fascia and the peritoneum. It however requires an additional port to introduce a laparoscopic needle driver to drive the needle from the inside. If it is difficult to make the needle come out in a correct position, a large hollow needle should be inserted outside-in to direct the exit of the Keith needle from the abdominal cavity. Both needles are then pulled out together.

15) Skin closure

The small abdominal incisions should be closed with a non absorbable suture which should be removed in 5 – 7 days. Alternatively, a subcutaneous absorbable suture may be used.

DIAGNOSTIC LAPAROSCOPY IN CHRONIC ABDOMINAL CONDITIONS

I. Tuberculosis of the abdomen

Abdominal tuberculosis comprises of tuberculous infection of the gastro-intestinal tract, mesenteric lymph nodes, peritoneum, omentum and solid organs – liver and spleen. Abdominal tuberculosis is the commonest form of extrapulmonary tuberculosis. Primary tuberculosis has no other focus and secondary disease has other foci like the lung. Incidence 1% of all general hospital admissions in India. Primary is hyperplastic (70%) and secondary disease is ulcerative(30%).

Classification

1) Peritoneal tuberculosis

i) Acute

ii) Chronic - Ascitic type - generalized or localized

- Fibrous type - adhesive,plastic,miliary nodule

- Peritoneal - mesenteric adenitis, cysts, abscess, adhesion, omental.

2) Gastro intestinal tuberculosis

- Ulceratve, Hyperplastic, Fibrotic.

3) Solid organ tuberculosis - Liver, Spleen, Gall bladder, Common bile duct, pancreas

Organ	Incidence %
Peritoneum	37.6
Mesenteric lymph nodes	6.2
Oesophagus	0.16
Stomach	1.0
Duodenum	2.0
Small bowel	27.0
Ileo-Caecal	22.9
Appendix	0.4
Colon & Rectum	9.2
Liver	0.04
Pancreas	4.7

The terminal ileum and ileo caecal junction are most commonly involved. Tuberculosis of the omentum, spleen, pancreas, gall bladder and common bile duct is very rare but has been reported.

Diagnosis

- Hematological examinations may show presence of anemia and elevated ESR(>90%). Tuberculin test may be positive but does not differentiate between an active and inactive disease.
- In ascites,peritoneal fluid is straw coloured with proteins more than 30g/l, cells more than 1,000/cu.mm(mostly lymphocytes), ascitic/blood glucose ratio of less than 0.96, and adenosine deaminase(ADA) levels of more than 33 U/l. Acid fast bacilli (AFB) are rarely seen on smear but may be cultured from the ascitic fluid.

- Confirmation of the diagnosis of tuberculosis at any site is established by demonstrating AFB on smear or mycobacterial culture from the tissue or by demonstrating the caseating granuloma at histopathology.
- CT scan of the abdomen is only marginally more specific for abdominal tuberculosis than USG, though abdominal CT scan is much more sensitive than USG in detecting the high density ascites and changes of thickening in mesentry, peritoneum, bowel wall and omentum.

Role of laparoscopy

- Laparosopy is diagnostic in 92% of patients with abdominal tuberculosis and the most specific diagnostic test for abdominal tuberculosis, with its advantages of histological confirmation.
- The positive identification of M.Tuberculosis is made only in 50% of cases. The complication rate is <5%.
- In patients with relevant background and clinical history, laparoscopy is the investigation of choice.

II. Post operative Adhesions

Intra abdominal adhesions are common and a major clinical problem. Most of them occur as result of injury to the peritoneum in the form of surgery or infection. After laparotomy, 95% of patients are found to have adhesions on subsequent operations. Some develop lifelong adhesion related disease.

Adhesions are common cause of small bowel obstruction(40 – 64%). It is a common cause of secondary infertility in females(39%). Adhesions have also been proposed to cause chronic abdominal and pelvic pain.

Clinical problems related to adhesions

- Small intestinal obstuctions
- Secondary female infertility
- Ectopic gestation
- Chronic abdominal and pelvic pain.
- Difficult reoperations

Investigations :

Plain X –ray abdomen : The sensitivity of plain X ray for the detection of complete intestinal obstruction is about 50%. The sensitivity is lower for detection of incomplete intestinal obstruction.

Small bowel follow-through using gastrograffin has both a diagnostic and therapeutic effect.

Contrast enhanced CT is increasingly used in the assessment of patients with small bowel obstruction. The sensitivity and specificity reported for CT are 100% and 83% viz.

Patient-assisted laparospcopy or conscious pain mapping is used for identifying the cause for chronic abdominal and pelvic pain.

Management :

When clinically indicated surgical treatment of intestinal adhesions are adhesiolysis which can be performed by laparoscopy or laparotomy. Currently laparoscopy is replacing laparotomy as the method of choice for elective adhesiolysis. Laparoscopy is associated with less peritoneal injury, less denovo adhesion formation and has the other advantages to minimally invasive surgeries.

Laparocopic Adhesiolysis

Principles of adhesiolysis :

Adhesiolysis may be performed with scissors, a monopolar microneedle or laser. In all cases it is essential that the adhesion be divided as close as possible to its attachment and not in the middle of the adhesion.

In general, adhesiolysis should commence at the abdominal wall and proceed caudally towards the pouch of Douglas. However, if there are extensive abdominal adhesions it may only be possible to divide them from below upwards and in this case it may be helpful to use a 5mm laproscope through one of the lower incisions to improve access.

Careful study of the adhesions will usually reveal an a vascular area to divide, but if there are any vessels they should be coagulated before division. The scissors, micro – needle or laser should always approach the adhesion at right angles. The most appropriate portal should be chosen to achieve this objective. Traction should be placed on the adhesions by

atraumatic forceps to position the adhesion correctly. Scissor dissection may be close to the organ but electric energy or laser should be applied 1 – 2 mm away from the organ to prevent damage by lateral spread of heat. For the same reason, only blunt or scissor dissection should be used when two organs, such as loops of bowel, are adherent to each other with no appreciable space between them.

Operating techniques – Bipolar Scissors dissection, Hydro dissection, Electrosurgery, Laser surgey, Harmonic scalpel.

III. Chronic Appendicitis

Although rare, chronic appendicitis can explain persistent abdominal pain in some patients. Patients do not present with typical symptoms of acute appendicitis. Instead they complain of weeks to years of right lower quadrant pain, and may have had multiple medical evaluations in the past. When queried, they may describe an intial episode with more classic symptoms of acute appendicitis for which no treatment was delivered. Diagnosis can be difficult as laboratory and radiological findings are typically normal. Pathology evaluation revealing chronic inflammation confirms diagnosis. Because, diagnosis is often is uncertain preoperatively, laparoscopy can be a useful tool allow exploration of the abdomen.

Incidence

Common age group affected is 5-30 years and it is sometimes encountered in infants as well. Below the age of 25years, males are more affected and above 25years the incidence is equal in both the sexes.

Investigations and Diagnosis:

It must be remembered that appendicitis is essentially a clinical diagnosis, there is no laboratory or radiological test yet that is 100% diagnostic. In the early stages laboratory tests are of little value. Almost 1/3 of patients will have normal total WBC count. More than half will have mild elevation. There is evidence to suggest that total and differential counts do not correlate well with the degree of inflammation. Clinical diagnosis should take precedence over laboratory tests. Other tests like C-reactive protein estimation are of limited use. Urinalysis is helpful for differential diagnosis.

X – Ray in general, cannot be used for confirming the diagnosis. Findings which suggest appendicitis are cecal distension, sentinel loop of small bowel in right iliac fossa and mass outside the caecum.

USG and CT scan – USG done by a good sinologist has an accuracy greater than 90%. The diagnosis is made by ; a maximal cross sectional diameter of more than 6mm, non-compressiblity, fecolith, mass, abscess and periappendicular fluid. Many studies have proved CT scans having more accuracy than USG. Recent developments include radio nucleotide imaging

studies that are suppose to be highly accurate in diagnosis. Diagnostic laparoscopy has a sensitivity and specificity of 100%, as evidenced by many studies.

Role of Laparoscopy

Suspected Appendicitis

The incidence of negative laparotomy in patients suspected to have appendicitis is 20%. Diagnostic laparoscopy has reduced this rate to 10%. It is especially useful n fertile women and obese patients. The rate of perforation is also reduced. The earlier dictum was “when it doubt, take it out”. This has now changed to “when it doubt, check it out”. Laparoscopy is a very valuable tool in the situation where the diagnosis is in doubt. Not only can the appendix be visualized, other organs can also be inspected as well. It is far superior access than a McBurney’s incision gives. If there is appendicitis laparoscopic appendicectomy offers all the benefits of minimally invasive therapy like less pain, shorter hospital stay, early return to work and physical activity and better cosmesis. Obese patients benefit more from laparoscopy because they would need a larger incision than thin patients, whereas in laparoscopy the trocars are the same for both. Infection rate is probably lower as the pelvis can be irrigated thoroughly which is not possible in open method.

Indications for appendicectomy during diagnostic laparoscopy and incidental appendicectomy as a part of the other procedure:

- Acute Appendicitis
- Large Fecolith
- Long kinked appendix

Even if the examination is normal, appendicectomy is to be done to simplify the future differential diagnosis of pelvic pain and to treat early mucosal (catarrhal) appendicitis which may not be obvious macroscopically. If some other surgical pathology is identified, it should be treated laparoscopically if possible.

Laparoscopically assisted appendicectomy

Laparoscopy is performed through the standard primary cannula introduced through the umbilicus. Two secondary tracers and cannulae of 5 and 10mm diameter are inserted as an atraumatic forceps is introduced through the 10mm cannula in the right iliac fossa and the appendix grasped and pulled up into the cannula, this places the acutely inflamed appendix and mesentery under tension. A fine bipolar dissecting forceps is introduced through the 5mm cannula in the left iliac fossa and the mesentery separated from the appendix using a combination of electro and blunt dissection.

After separation of the mesentery, the appendix is usually very mobile and in 90% of cases can be delivered to the surface by pulling out the right iliac fossa cannula with the grasping forceps still attached to the tip of the appendix. When the base of the caecum appears on the surface of the abdominal wall, a traditional appendicectomy can be performed.

Chronic appendicitis in Situs inversus

Appendix and caecum are found in the left iliac fossa usually associated with situs inversus totalis where there is mirror image displacement of bowels. Surgeon operates standing on the right side of the patient,patient positioned supine with left side up. Three ports placed as a mirror image of the conventional port placement. The difference is the supra pubic port 10mm always is used as working port instead of the umbilicus.

IV. Mesenteric Adenitis

Inflammation of the mesenteric lymph nodes that cause enlargement. The enlarged nodes are usually clustered in the right lower quadrant small bowel mesentery or ventral to the psoas muscle. Age related, most common in patients <1 year of age. History of recent sore throat or upper respiratory tract infection found in 20–30% of subjects. Most common cause of acute abdominal pain in young adults and children Self-limiting condition. Most common cause of inflammatory adenopathy, more common than tuberculosis. Lymph nodes involved are those draining the ileocecal area: Absorption of toxic products or bacterial products secondary to stasis. Nodes are enlarged up to 10 mm, discrete, soft, and pink, and with time become firm: Calcification and suppuration are rare. Cultures of the nodes

are negative. Reactive hyperplasia: Adenitis results from a reaction to some material absorbed from the small intestine, reaching the intestine from the blood or lymphatic system. Hypersensitivity reaction to a foreign protein

Diagnosis **c**an be difficult to differentiate from appendicitis clinically, and many patients may have a laparotomy before the right diagnosis is made. An important clinical feature is that the patient cannot localize the exact point of the most intense pain, unlike appendicitis.

Investigations

Mesenteric adenitis is a diagnosis of exclusion. It can only be diagnosed accurately at laparoscopy or laparotomy. Ultrasound or computed tomography (CT)-scan may demonstrate enlarged mesenteric lymph nodes. Complete blood count and C-reactive protein can be increased but are not specific. Abdominal ultrasound: Differentiates among acute appendicitis, pelvic inflammatory disease, ovarian pathology, and mesenteric adenitis. Contrast-enhanced CT scan of the abdomen and pelvis Magnetic resonance imaging (MRI)

Treatment - Laparoscopic surgery/Laparotomy.

V. Liver abscess

Laparoscopic approach is helpful when the abscess cavity is in the dome of the diaphragm(segment VII and VIII). Cavity identification is appropriate and concurrent biliary and other abdominal pathology could be made out. Abscess cavity can be drained under vision and hemostasis can easily be secured.

VI. Undesended testis

Diagnostic laparoscopy is helpful in cases of undesended testis to localise the intra abdominal testes when other investigations fail to diagnose

MATERIALS AND METHODS

1. Patients subjected to this study were taken form surgical unit of Government Rajaji Hospital, Madurai over a period of two years from November 2007 to November 2009.
2. Patients underwent underwent diagnostic laparoscopy (36 males and 44 females) for chronic abdominal symptoms.
3. Factors such as age, sex, previous surgery, duration of pain, and number of attacks were taken into account.
4. Patients were investigated with Complete blood count, Liver function test,ultra sonogram and computed tomography of abdomen and pelvis.
5. Diagnostic laparoscopy was performed under general anesthesia by trained surgeons.
6. Biopsy specimen were subjected to Histopathological examination.
7. Ascitic fluid sent for biochemical examination and cytology. Pus from abscess cavities was sent for microbiological examination.

OBSERVATION AND DISCUSSION OF THE STUDY

The total number of cases studied is 80 which included 44 female and 36 male patients.The patient were attending the surgical out-patients department of Government Rajaji Hospital,Madurai.

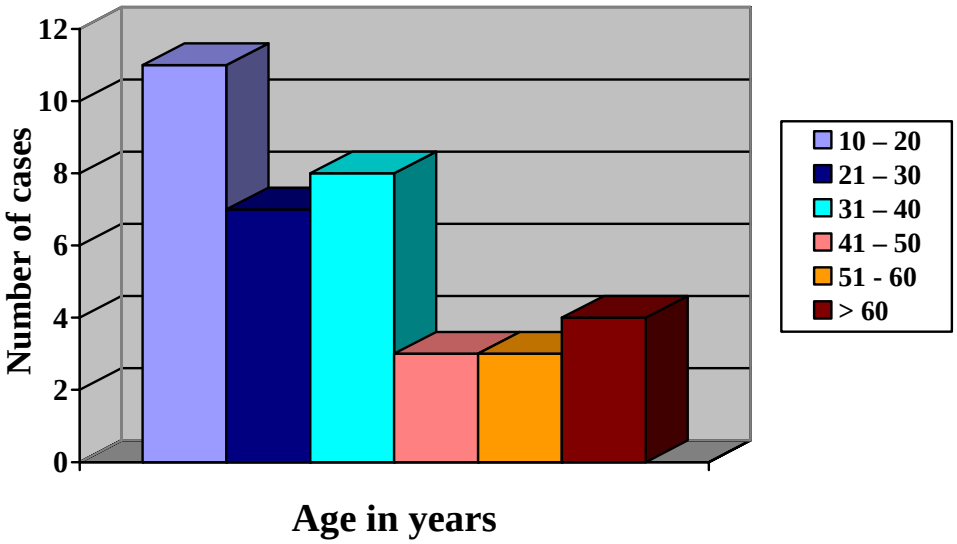
Among 44 female cases, the common age groups presented with chronic abdominal symptoms were between 31 – 40 years and among 36 male cases, were between 10 – 20 years.

The incidence of chronic abdominal pain in different age groups is shown in table below

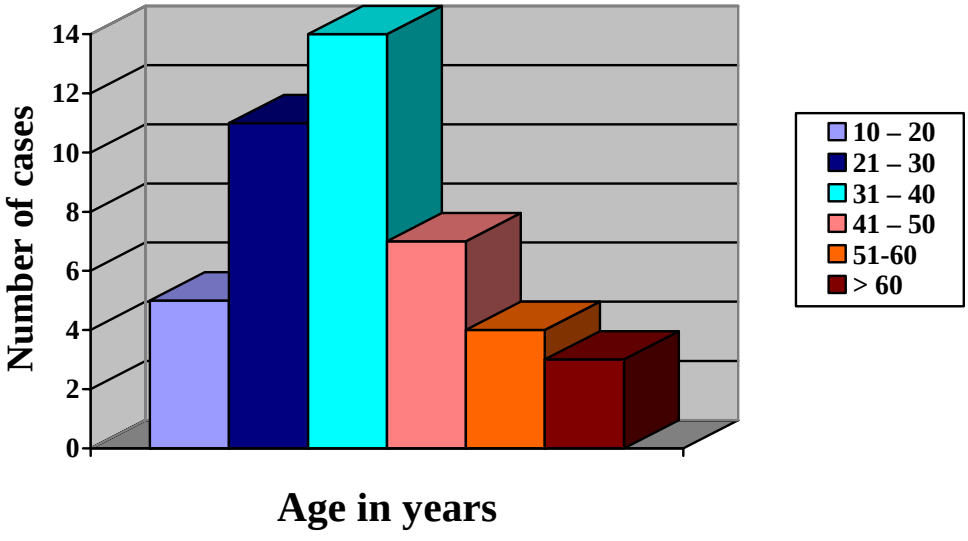
Age(years)	**Studied series**	
	Females	**Males**
10 – 20	5	11
21 – 30	11	7
31 – 40	14	8
41 – 50	7	3
51 - 60	4	3
> 60	3	4

From the study, the commonest cause of admission for chronic abdominal conditions in females were found to be due to post-operative adhesions followed by chronic appendicitis and Tuberculous abdomen, whereas in males commonest cause were Tuberculous abdomen, Mesenteric adenitis and others as in Table given below.

Age wise incidence of chronic abdominal conditions in males



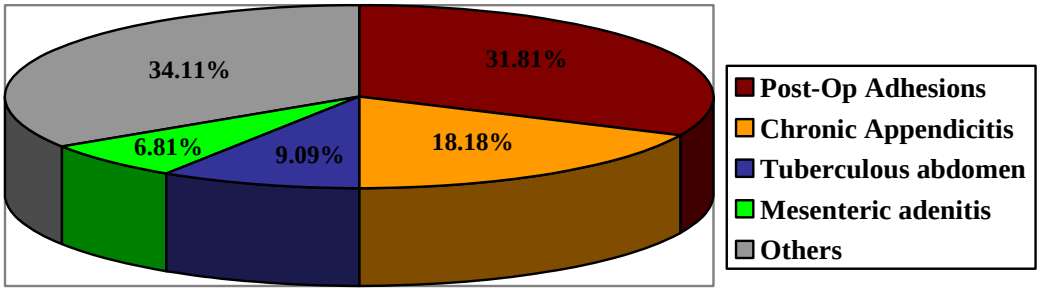
Age wise incidence of chronic abdominal conditions in females



Etiology of admission for chronic abdominal conditions in females

Eetiology	Studied series (44 females)	
	Number	%
Post-operative adhesions	14	31.81
Chronic appendicitis	8	18.18
Tuberculous Abdomen	4	9.09
Mesenteric adenitis	3	6.81
Malignancy	1	2.27
Pelvic inflammatory disease	4	9.09
Ovarian cyst	3	6.81
Endometriosis	2	4.54
Pelvic Abscess	1	2.27
Liver abscess	1	2.27
Appendicular perforation	1	2.27
Diaphragmatic hernia	1	2.27
Situs Inversus totalis	1	2.27

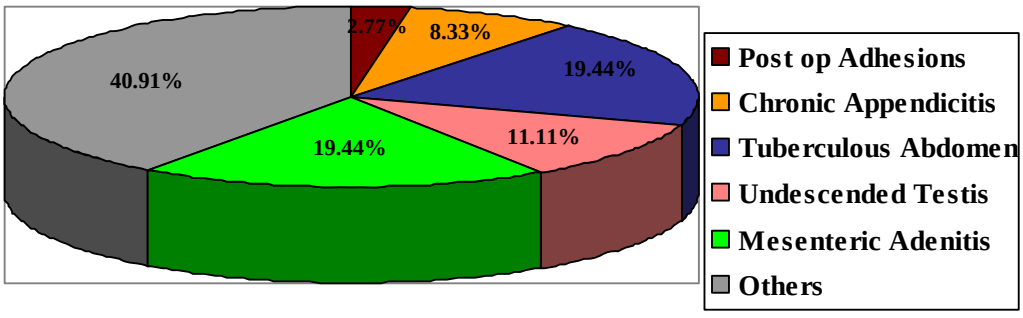
Percentage of incidence of chronic abdominal conditions in females



Etiology of admission for chronic abdominal conditions in males

Etiology	Studied series (36 males)	
	Number	%
Post-operative adhesions	1	2.77
Chronic appendicitis	3	8.33
Tuberculous Abdomen	7	19.44
Undescended testis	4	11.11
Mesenteric adenitis	7	19.44
Liver abscess	6	16.66
Malignancy	4	11.11
Pelvic Abscess	1	2.77
Diaphragmatic Hernia	1	2.77
Post-op Appendicular stump abscess	1	2.77
Necrotising Pancreatitis	1	2.77

Percentage of incidence of chronic abdominal conditions in males



In the study of diagnostic laparoscopy in 80 cases of chronic abdominal conditions, in females(44 cases) 14 cases presented with chronic abdominal pain due to post-operative adhesions, of those 8 cases were due to previous caesarian section 4 cases were due to previous abdominal surgeries, 2 cases were due to sterlisation. In males (36 cases), 1 case presented with pain due to previous abdominal surgery. Out of these 15 cases after adhesiolysis, 12 cases showed were pain free, while 3 cases had persistent pain post operatively. These 3 cases on regular follow up showed improvement with conservative management.

Abdominal tuberculosis was found in 11 cases, 4 females and 7 males in the average age group of 20 – 30 years. Peritoneal tuberculosis was found in 9 cases, Ileocecal tuberculosis in 2 cases. Peritoneal biopsy was taken and sent for histopathological examination which revealed tuberculosis. Ascitic fluid analysis done for 2 cases ATT was instituted for all the 11 cases and they responded well.

Chronic Appendicitis was found in 11 cases, in 8 females and in 3 males for which appendicectomy was done.1 case was peculiar, she presented with pain in left iliac fossa which turned out to be chronic appendicitis in Situs Inversus Totalis. 1 case presented with appendicular perforation, and 1 case with Post operative appendicular stump abscess for which drainage was done On review, 11 cases were symptom free, 1 case

had persistent pain managed conservatively and 2 cases had wound infection postoperatively which was managed with Antibiotics.

Diaphragmatic hernia was seen in 2 cases, 1 male and 1 female which was treated by open surgery. Mesenteric adenitis was found in 10 cases, 3 females and 7 males, in which no other significant laparoscopic findings were seen.

In females, Pelvic Inflammatory Disease was seen in 3 cases, Ovarian cyst in 3 cases and Endometriosis in 1case which were managed accordingly.

In males, undescended testis was seen in 4 cases for which laparoscopic orchidectomy was done.

Pelvic abscess was seen in 2 cases, 1 male and 1 female. Laparoscopic drainage was done. Treated with Antibiotics depending on microbiologic report of pus culture and sensitivity.

Among 80 cases, 5 cases showed malignancy, 4 in male and 1 in female patients. They were secondaries liver, Hepatocellular carcinoma. Growth sigmoid colon and carcinoma rectum. They were assessed for operability and managed accordingly. Liver abscess were seen in 6 male and 1 female patients for which laparoscopic abscess drainage was done. Necrotising pancreatitis was seen in one male case for which laparoscopic necrosectomy was done.

Patient who underwent diagnostic laparoscopy stayed in hospital for 3 days on an average, and were discharged uneventfully.

Among 80 cases,2 cases had port site infection and no other complications were seen.

Complications	**No. of cases**
Wound/Port site infection	2 (2.5%)
Wound dehiscence	0
Respiratory infection	0
Port site/incisional hernia	0

REVIEW OF LITERATURE

With the increasing popularity of laparoscopy, more patients with chronic abdominal pain are undergoing diagnostic laparoscopy and adhesiolysis.Several studies showed 80% improvement in pain after adhesiolysis.These studies suggest that adhesion related chronic abdominal pain appears to be much more common than what most surgeons appreciate. Results of laparoscopic adhesiolysis for chronic abdominal pain

Author	**Year**	**Percentage of improvement**
Frey SM	1994	80%
Mueller MD	1995	80%
Scheitroma M	2001	>80%
Shayani V	2002	77.8%
Swank D J	2003	74%
Dunker M S	2004	45%

In a review of 388 patients with abdominal adhesions, 79% had a history of surgery, 18% had a history of peritoneal infection and 11 % had congenital adhesions.

A collective analysis of 6 series showed that 36% patients (680 of 1897) presenting with post operative adhesional intestinal obstruction had undergone appendicectomy. In women, the commonest cause of post operative adhesive intestinal obstruction is previous hysterectomy.

Dr.C.Palanivelu's study on abdominal tuberculosis shows in 230 cases , there were 132 males and 98 females. Average age being 52 years.

Location	Incidence	%
Peritoneal	95	41.3
Ileocecal	83	36
Ileal	2	27
Appendix	6	2.6
Colon	17	7.3
Gall bladder	2	0.87

Peritoneal tuberculosis cases were treated by diagnostic laparoscopy and peritoneal biopsy, followed by Anti-tuberculous therapy.Out of 83 cases of ileocecal tuberculosis, 63(27.3%) cases had intestinal obstruction and underwent limited laparoscopic resection with primary anastomosis followed by ATT. The other 20(9%) were treated with diagnostic laparoscopy with biopsy and ATT.

In chronic appendicitis, evaluation with ultrasonogram is operator dependent. However, it is frequently unable to visualize normal appendix. A recent metanalysis of 14 prospective studies showed Ultrasound to have sensitivity of 0.86 and specificity of 0.81. Computed Tomography meta-analysis of 12 prospective studies showed sensitivity of 0.94 and specificity of 0.95.

Accuracy of Computed tomography and ultrasound for diagnosis of appendicitis

Study		Sensitivity %	Specificity %	Accuracy %
Balthazar et al	CT	96	86	94
	US	76	91	83
Horton et al	CT	97	100	98
	US	76	90	80
Wise et al	CT	96	92	93
	US	62	71	69
Terasawa et al (Meta analysis)	CT	94	95	N/A
	US	86	81	N/A

Diagnostic laparoscopy has a sensitivity and specificity of 100% as evidenced by many studies. Dr.C.Palanivelu's study ; laparoscopic approach for pathological or anatomical type of appendicitis.

Accuracy of diagnosis (Open Vs laparoscopy – 175 cases)				
	PPV %	FP %	NPV %	FN %
Open	91	1	74	26
Laparoscopy	96.5	0	95	5

PPV – Positive predictive value FP – False positive

NPV – Negative predictive value, FN – False negative

Studies on Pelvic Inflammatory Disease and Pelvic abscess

Henry Suchet's cases were extensions of the diagnostic laparoscopy routinely used in France to diagnose Pelvic Inflammatory Disease. The

classic studies of Westrom (1980 ; Jacobson 1980), confirmed in Canada (sellors et al, 1991), indicate that Pelvic Inflammatory Disease is misdiagnosed 30 to 50% of the time.

The position in the united states of reserving diagnostic laparoscopy for women in whom the clinical diagnosis is uncertain or when therapy is unresponsive in 48 hours (kahn et al,1991) is flawed reasoning. All cases are uncertain(accuracy no better than random[sellors et al 1991]) and most women with normal pelvis will “respond” in 48 hours of therapy and will bear the psychologic stigmata of a misdiagnosed Pelvic Inflammatory Disease (Morcos et al, 1993)

CONCLUSION

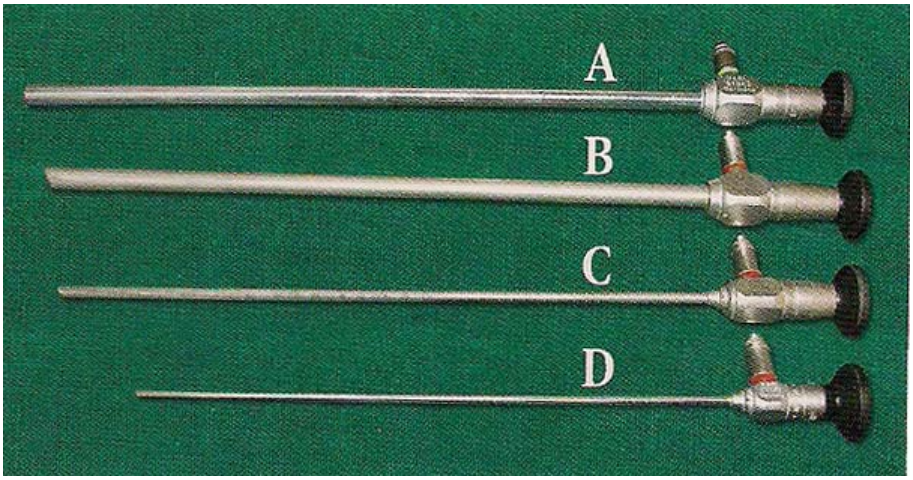
The study was successfully completed and diagnostic laparoscopy was proved successful in diagnosing chronic abdominal conditions in 100% cases out of which 56.25% was therapeutic too.

The study revealed that diagnostic laparoscopy can safely be used when other investigatory modalities fail to clinch the diagnosis.

Diagnostic laparoscopy continues to have a place in the diagnostic armamentarium, preventing unnecessary exploration for those patients who would not benefit and not precluding an open procedure from those who gain from it. It is a great comfort to the patient since it avoids unnecessary investigations and procedures.

DIGITAL CAMERA

LAPAROSCOPES



A – 0^{o} – 10mm

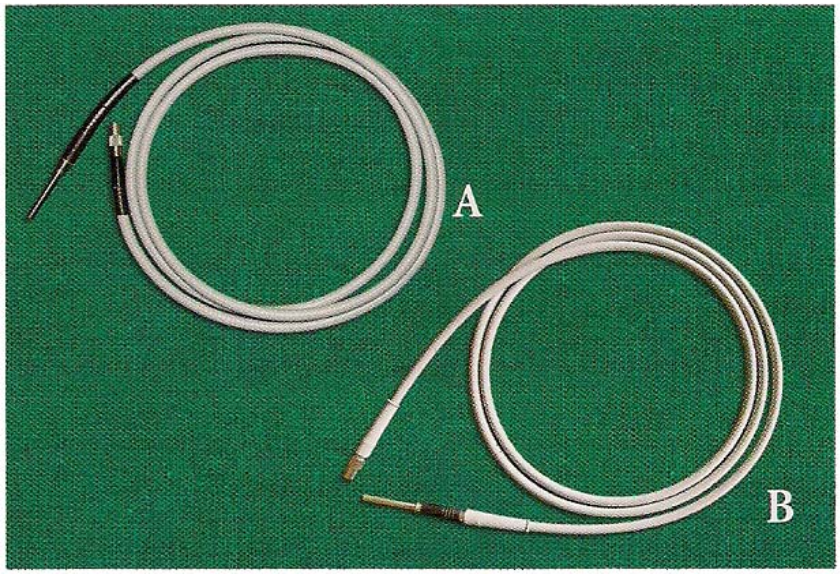
B – 30^{o} – 10mm

C – 30^{o} – 5mm

D – 30^{o} – 3mm

LIGHT SOURCE

LIGHT CABLES

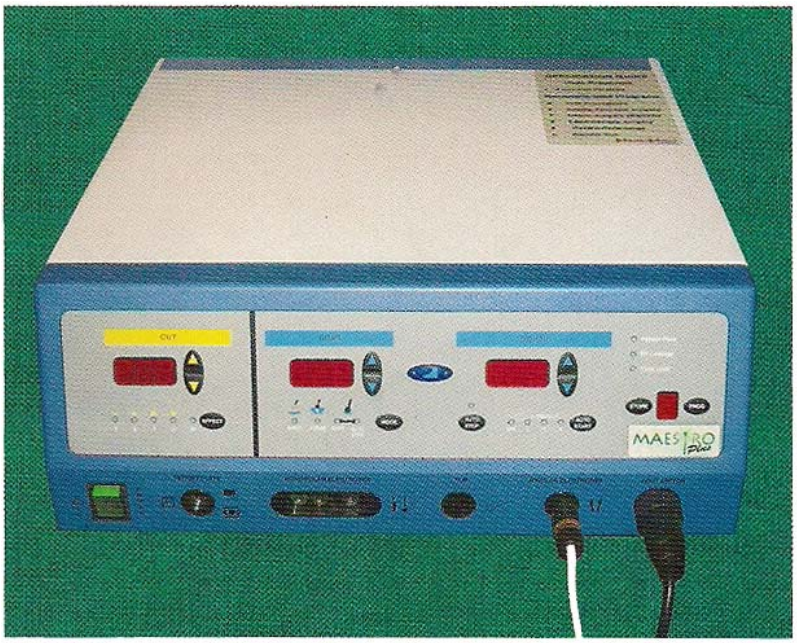


A – Fluid Cable

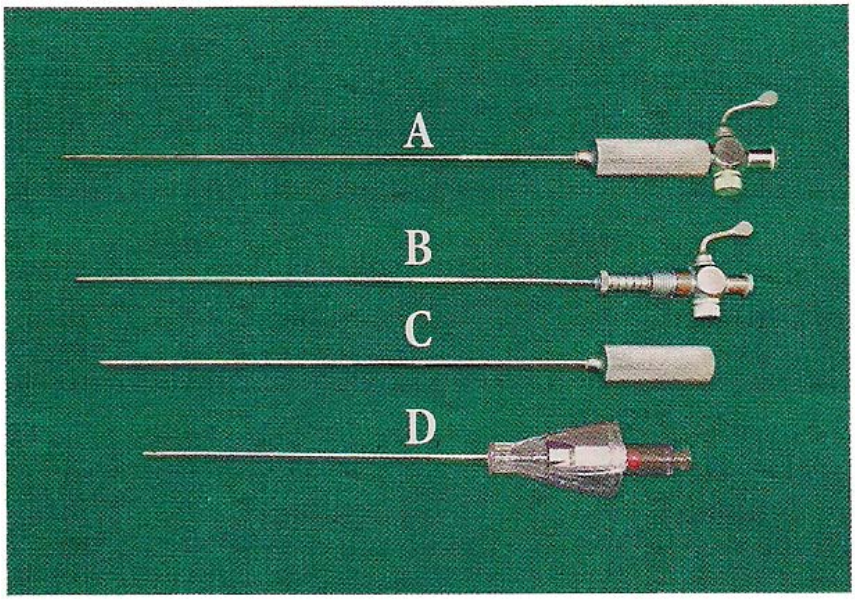
B – Fibre Optic Cable

CARBONDIOXIDE INSUFFLATOR

ELECTROCAUTERY



VERESS NEEDLE



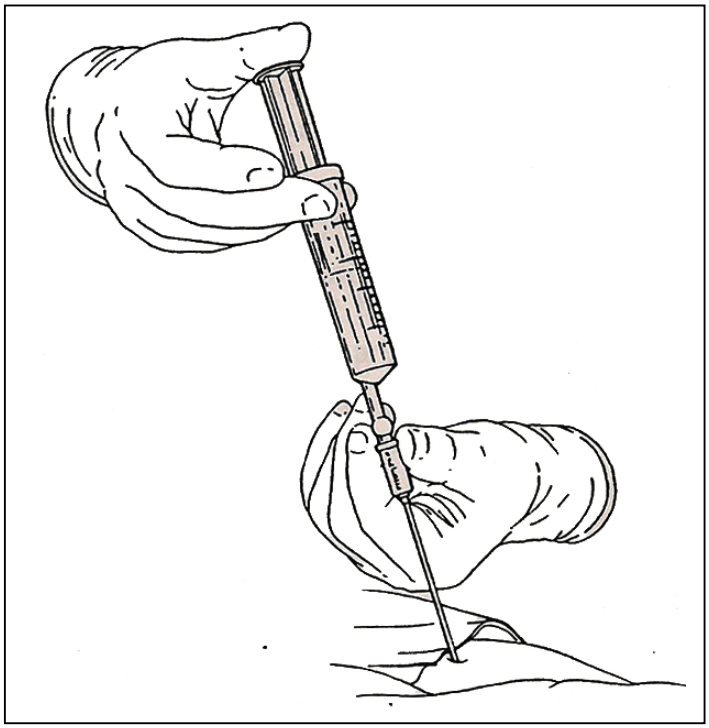
A – reusable veress needle

B – reusable veress needle – inner rod

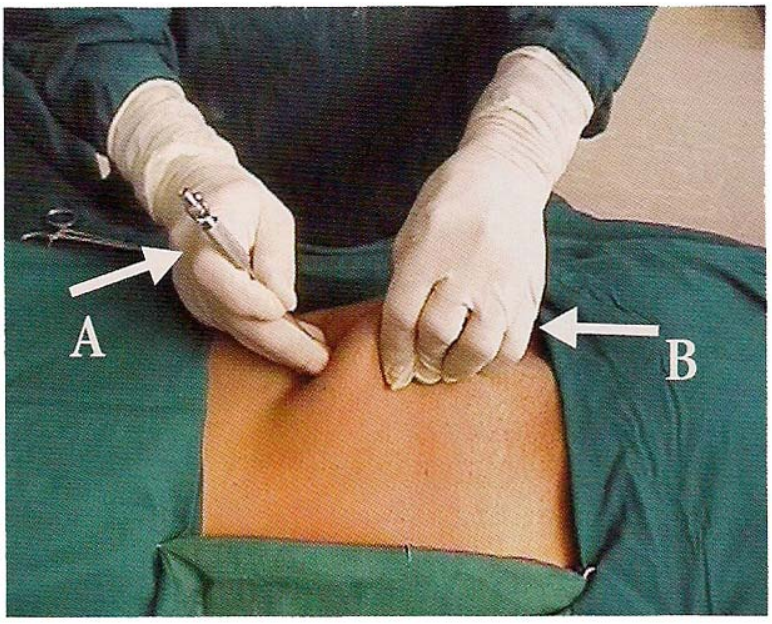
C – reusable veress needle – outer sheath

D – disposable veress needle

INJECTING NORMAL SALINE THROUGH THE VERESS NEEDLE



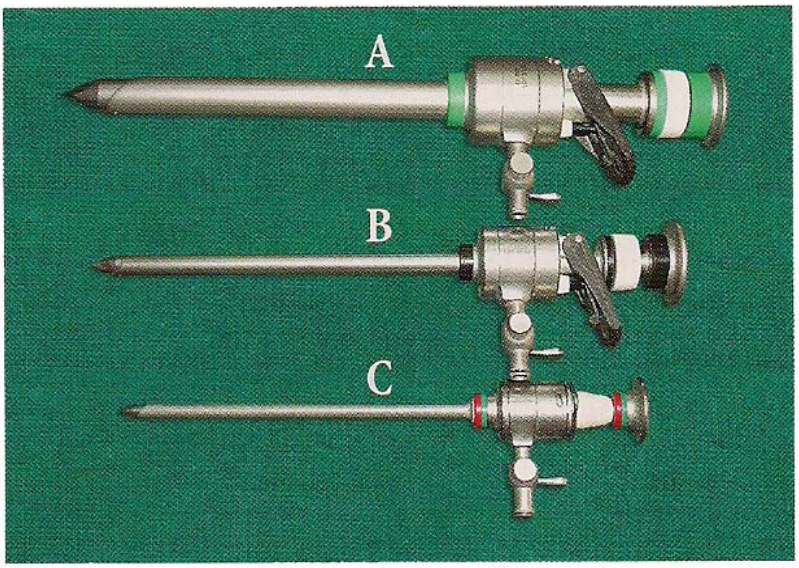
METHOD OF INSERTION OF VERESS NEEDLE



A – needle direction towards pelvis

B – abdominal wall lifted by left hand

RE-USABLE TROCARS



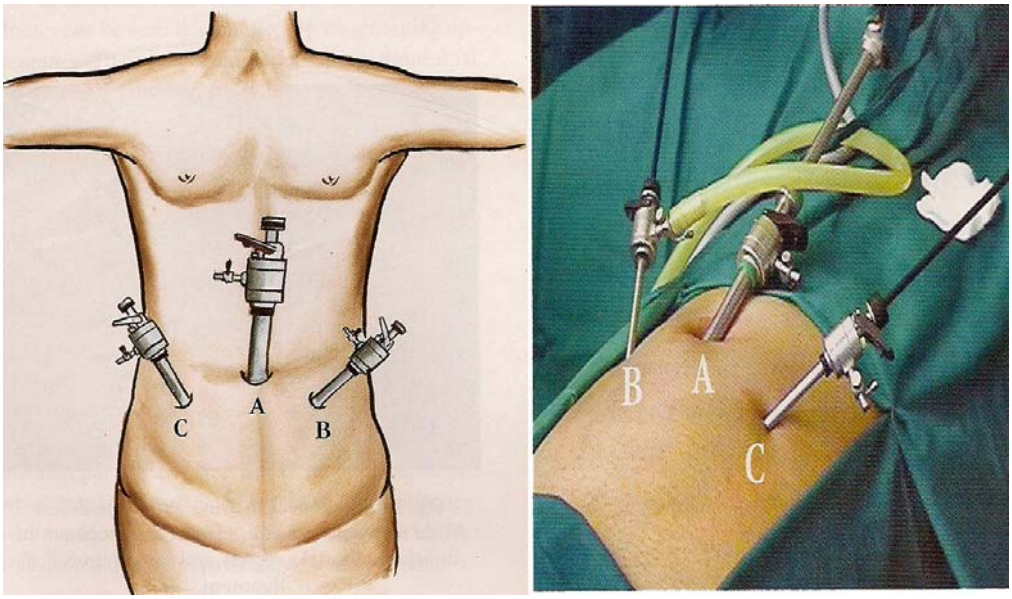
A – 10mm trocar

B – 5mm trocar

C – 3mm trocar

OPEN TECHNIQUE

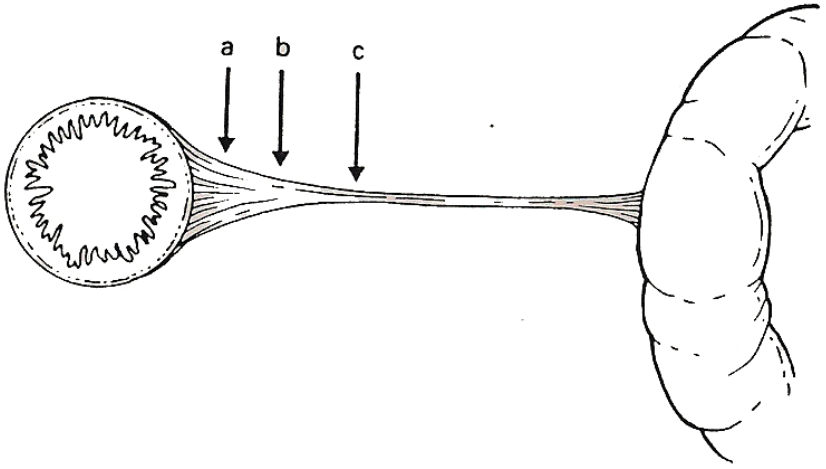
POSITION OF PORTS



A – Umbilical port

B & C – right and left pararectus ports

SITE OF DIVISION OF ADHESION CLOSE TO THE BOWEL



A – SCISSORS

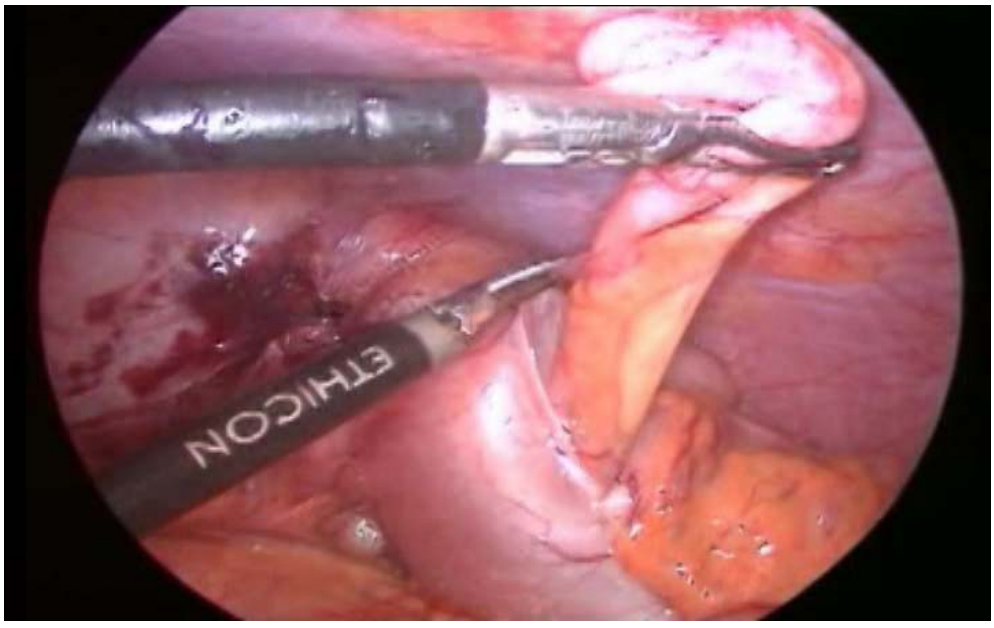
B – LASER

C – ELECTRO SURGERY

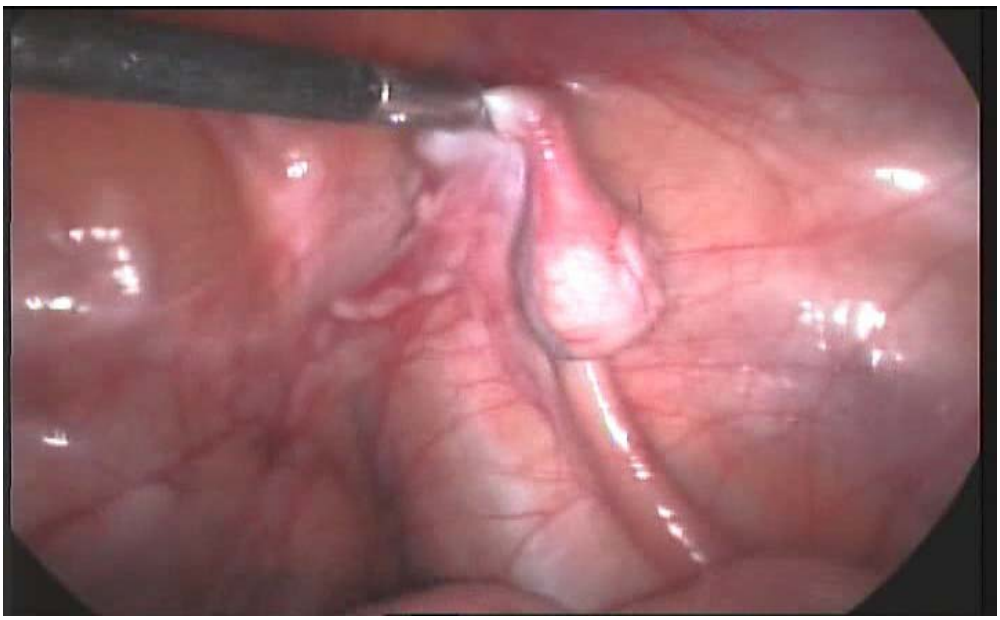
LAPAROSCOPIC ADHESIOLYSIS

LAPAROSCOPY SHOWING CHRONIC APPENIDICITIS

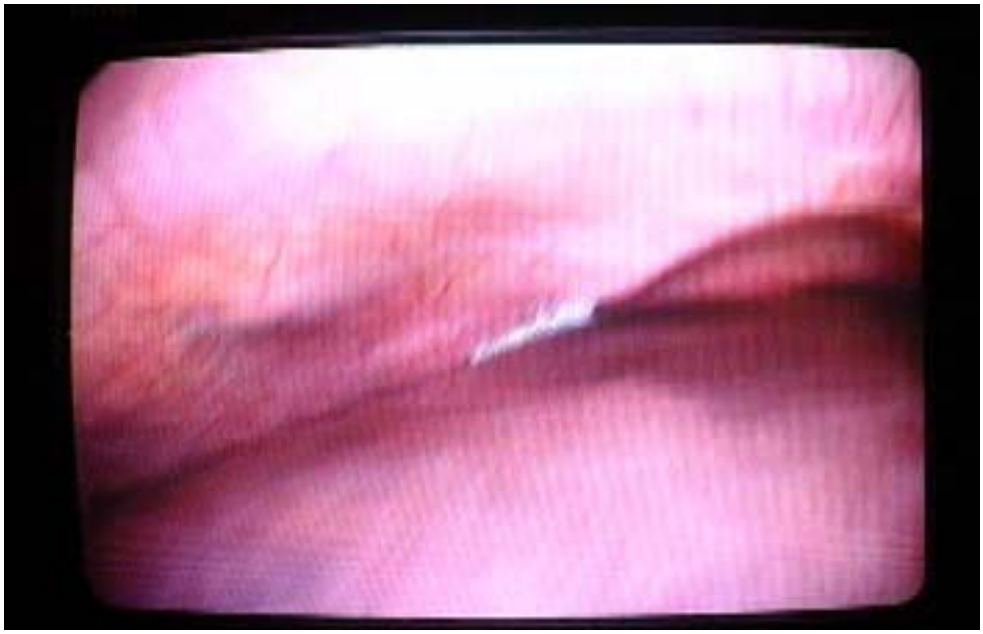
LAPAROSCOPIC APPENDICECTOMY

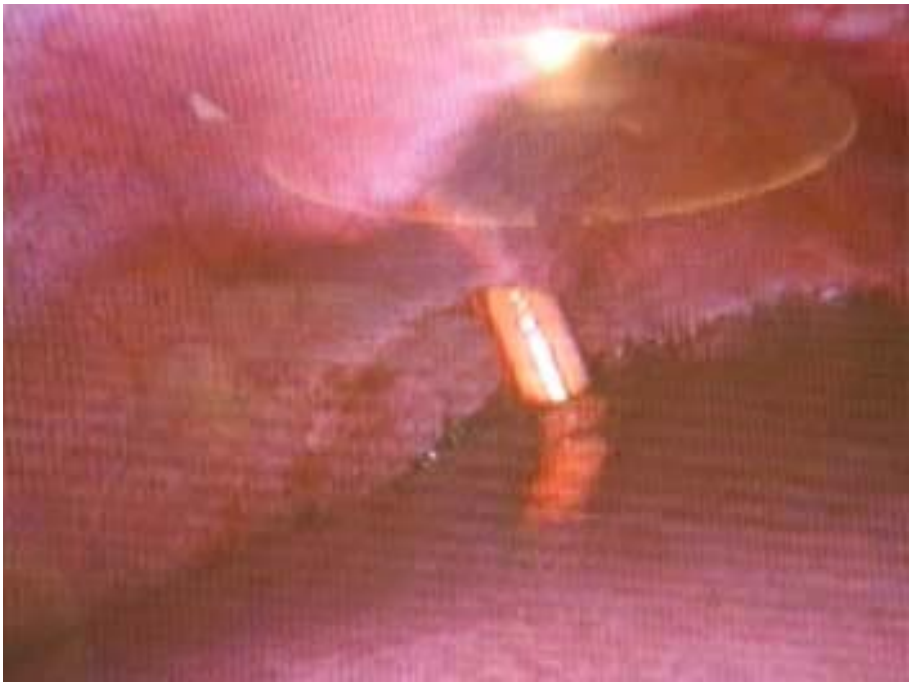


LAPAROSCOPIC ORCHIDECTOMY OF INTRAABDOMINAL TESTIS



LAPAROSCOPIC DRAINAGE OF LIVER ABSCESS

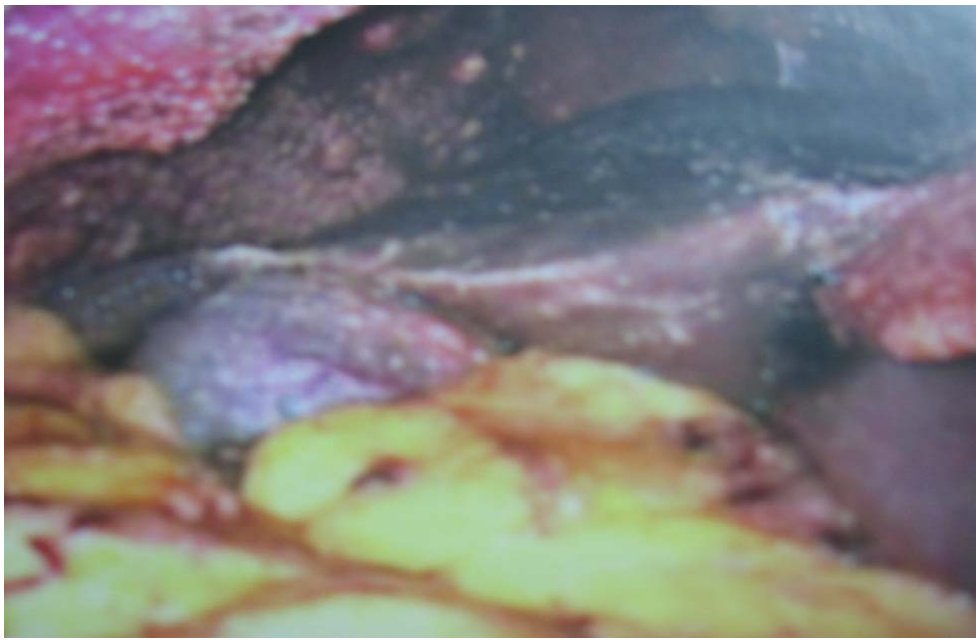




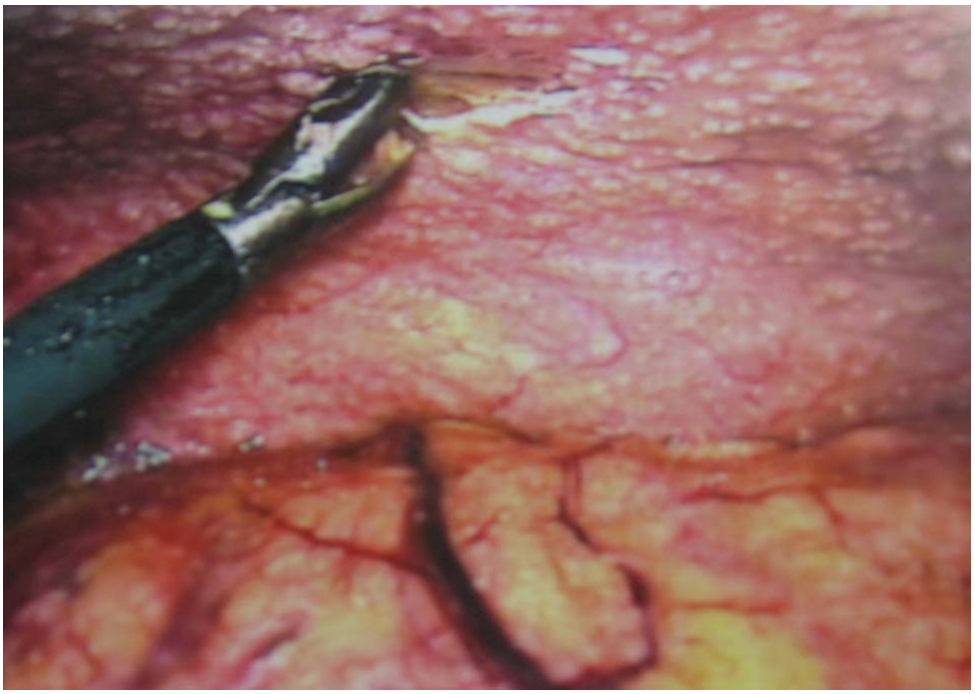
LAPAROSCOPY SHOWING OVARIAN CYST

LAPAROSCOPIC ASPIRATION OF OVARIAN CYST

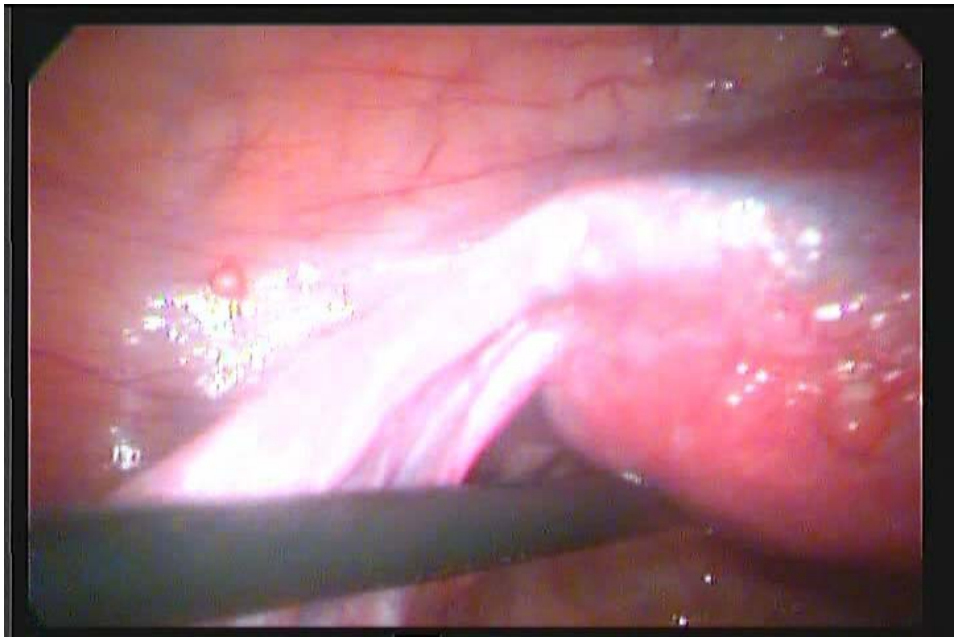
LAPAROSCOPY SHOWING
ABDOMINAL TUBERCULOSIS



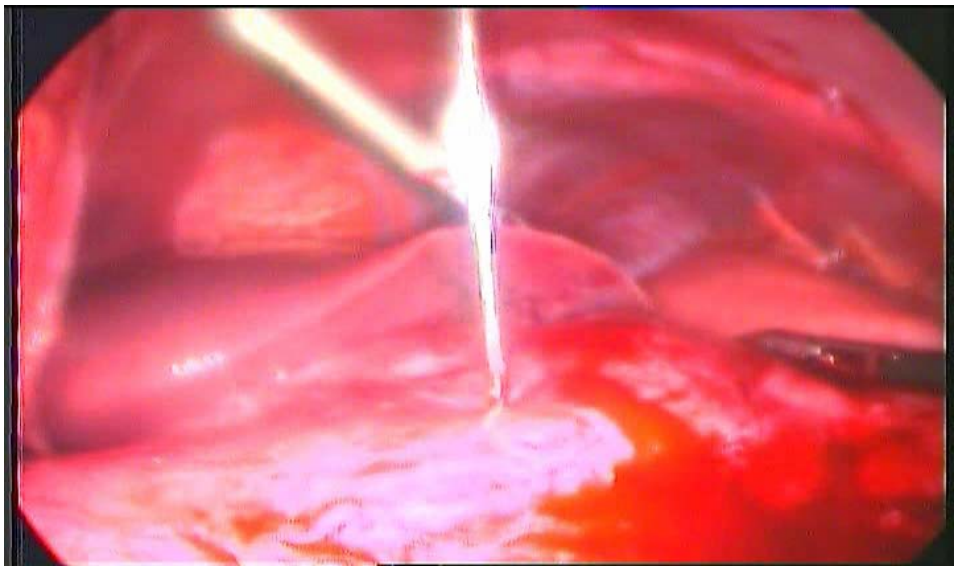
PERITONEAL BIOPSY



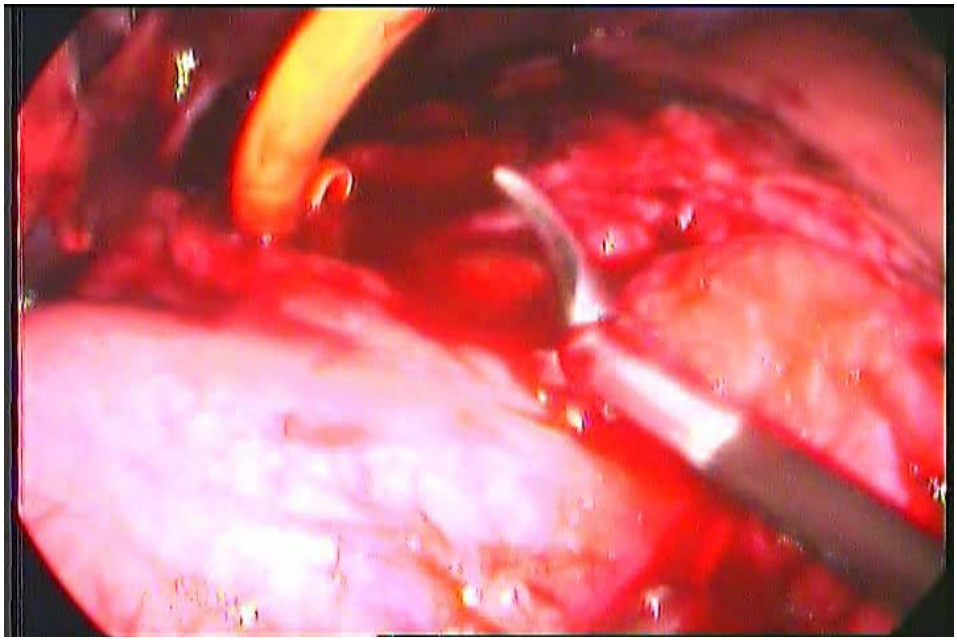
LAPAROSCOPIC CHROMOTUBATION



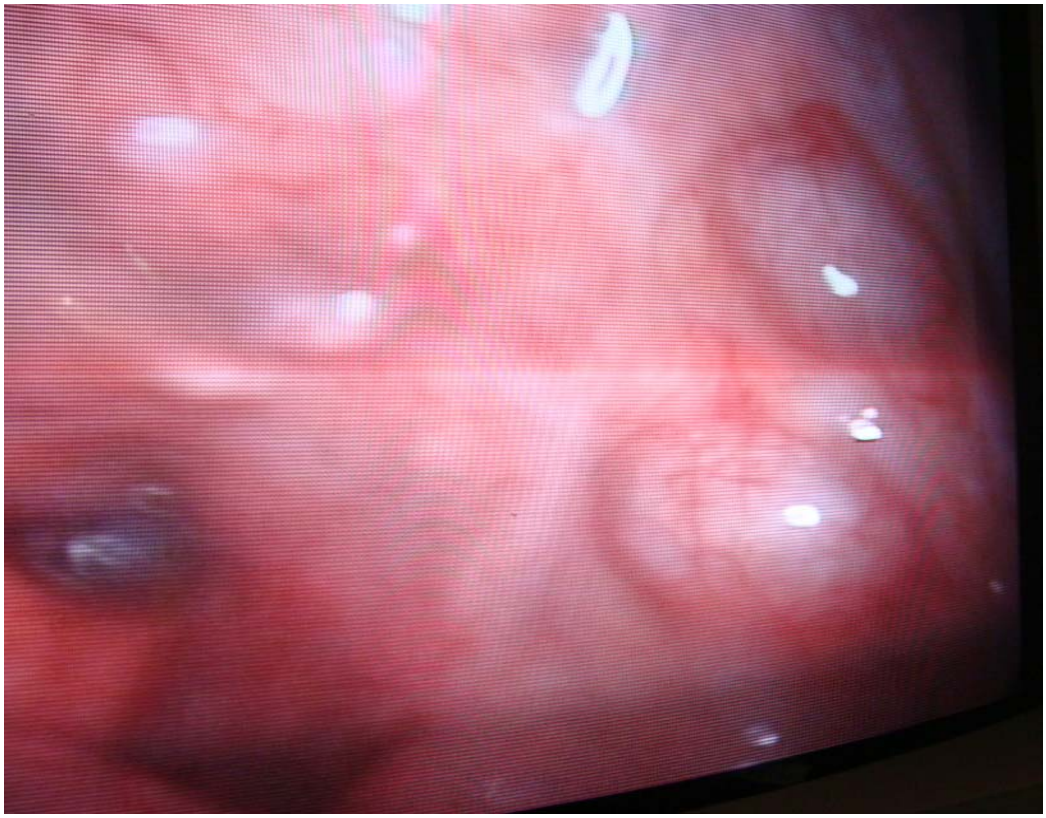
LAPAROSCOPY SHOWING NECROTISING PANCREATITIS



LAPAROSCOPIC NECROSECTOMY AND DRAINAGE DONE



MESENTERIC ADENITIS



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PROFORMA

SERIAL NO	IP/NO	DATE
NAME	AGE	SEX
ADDRESS	OCCUPATION	INCOME

COMPLAINTS :

1. PAIN ABDOMEN- Duration/No of attacks/site/radiation/ character
   Aggravating / relieving factors
2. FLATULENT DYSPEPSIA
3. NAUSEA & VOMITTING – Character, amount, frequency,
   Relation to food, relief of pain.
4. HEMATEMESIS & MALENA
5. JAUNDICE
6. BOWEL HABITS – Constipation/diarrhoea
7. APPETITE
8. FEVER
9. LOSS OF WEIGHT

PAST HISTORY : DM/HTN/PT/BA/IHD/EPILEPSY

PREVIOUS SIMILAR COMPLAINTS :

PREVIOUS ABDOMINAL SURGERY :

TREATMENT HISTORY

PERSONAL HISTORY

MENSTRUAL & OBSTETRIC HISTORY

GENERAL EXAMINATION

BUILT - GOOD / MODERATE/ POOR

NOURISHMENT - GOOD/MODERATE/MALNOURISHED/CACHEXIA

PALLOR EDEMA CLUBBING

CYANOSIS ICTERUS LYMPHADENOPATHY

PULSE BP TEMP RR

EXAMINATION OF THE ABDOMEN

INSPECTION

Contour – flat/scaphoid/distended

Skin - Scar/Sinus/engorged veins/visible pulsations/nodules

Umbilicus – site/shape

Movement with respiration

VGP/VIP/Visible mass

PALPATION

Tenderness

Mass if any

PERCUSSION

AUSCULTATION

PV/PR

OTHER SYSTEMS : RS/CVS/CNS

PROVISIONAL DIAGNOSIS :

INVESTIGATIONS :

1. ROUTINE – Blood Hb%, TC,DC,ESR. Sugar Urea, Creatinine
2. ECG
3. CHEST X - RAY
4. LFT
5. USG
6. CT ABDOMEN

MODE OF TREATMENT :

DIAGNOSTIC LAPAROSCOPY AND PROCEED.

ANAESTHESIA : GA / EPIDURAL / SPINAL

APPROACH : 10 MM I

II

5 MM I

II

III

THERAPEUTIC/DIAGNOSTIC

PROGRESS/FOLLOW-UP

COMPICATIONS - Wound infecton/Wound dehiscence/Port site hernia.

Sl. No	Name	Age	Sex	SYMPTOMS					SIGNS		INVESTIGATIONS				PROCEDURE					
				Pain Abdomen		Fever	Previous Abdominal surgeries	Others	Tenderness	Mass Abdomen	LFT	USG Abdomen	CT Abdomen	Others	Biopsy	Ascitic fluid	Abscess drainage	Appendicectomy	Adhesiolysis	**Solid organ pathology (Liver,Colon,Pancreas)**
				Duration in months	No. of attacks															
1	Chandra	36	F	4	2	-	+	-	-	-	N	N	N	N	-	-	-	-	+	-
2	Mahendran	14	M	6	3	-	-	-	-	-	N	N	-	N	+	-	-	-	-	-
3	Alagar	42	M	5	1	+	-	-	-	-	N	N	-	N	+	+	-	-	-	-
4	Arumugam	65	M	6	3	-	-	-	-	+	N	N	N	N	-	-	-	-	-	-
5	Sakthivel	16	M	4	2	-	-	-	+	-	N	N	-	N	-	-	-	+	-	-
6	Nallusamy	32	M	4	2	+	-	+	+	+	↑	N	-	N	-	-	+	-	-	L
7	Vasanthy	40	F	6	3	+	+	+	-	-	N	N	N	N	+	-	-	-	-	-
8	Shanmugam	61	M	4	2	+	-	+	+	+	↑	+	-	N	-	-	+	-	-	L
9	Sadam Hussain	18	M	5	3	-	-	-	+	-	N	N	N	N	-	-	-	-	-	-
10	Bavani	30	F	4	2	-	-	-	+	-	N	+	-	N	-	-	-	+	-	-
11	Geetha	28	F	4	1	-	+	-	-	-	N	N	N	N	-	-	-	-	+	-
12	Pitchai Udayar	70	M	5	3	-	+	-	-	-	N	N	N	N	-	-	-	-	+	-
13	Manikandan	14	M	3	1	-	-	-	+	-	N	+	-	N	-	-	-	-	-	-
14	Mariammal	40	F	3	4	-	+	-	+	-	N	N	N	N	-	-	-	-	+	-
15	Jayajothi	17	F	3	1	-	-	+	+	-	N	+	-	N	-	-	-	+	-	-
16	Ramalakshmi	30	F	3	2	-	+	-	+	-	N	N	N	N	-	-	-	-	-	-
17	Nagajothi	45	F	5	2	-	+	-	-	-	N	N	N	N	-	-	-	-	+	-
18	Subash	15	M	3	3	-	-	+	+	-	N	+	-	N	-	-	-	-	-	-
19	Anandavalli	23	F	4	4	-	-	+	+	+	N	+	+	N	-	-	+	-	-	L
20	Malliga	40	F	3	1	-	+	+	+	-	N	N	-	N	-	-	-	-	-	-

-

Sl. No	Name	Age	Sex	SYMPTOMS					SIGNS		INVESTIGATIONS				PROCEDURE					
				Pain Abdomen		Fever	Previous Abdominal surgeries	Others	Tenderness	Mass Abdomen	LFT	USG Abdomen	CT Abdomen	others	Biopsy	Ascitic fluid	Abscess drainage	Appendicectomy	Adhesiolysis	**Solid organ pathology (Liver,Colon,Pancreas)**
				Duration in months	No of attacks															
21	Devaki	52	F	4	2	-	+	-	-	-	N	N	N	N	-	-	-	-	+	-
22	Meenakshi	22	F	6	3	+	-	+	+	-	N	+	+	N	+	+	-	-	-	-
23	Banumathy	45	F	5	1	-	+	-	+	-	N	N	N	N	-	-	-	+	-	-
24	Padma	54	F	5	3	-	+	-	+	-	N	N	N	N	-	-	+	+	-	-
25	Hemalatha	36	F	3	3	-	+	-	+	-	N	N	-	N	-	-	-	-	-	-
26	Rajesh Kumar	32	M	4	5	+	-	+	+	+	↑	N	-	N	-	-	+	-	-	L
27	Adhilakshmi	13	F	4	2	-	-	-	+	-	N	N	N	N	-	-	-	-	-	-
28	Balakrishnan	38	M	5	4	+	-	+	+	+	↑	+	-	N	-	-	+	-	-	L
29	Sathish Kumar	16	M	4	2	-	-	-	+	-	N	N	N	N	-	-	-	-	-	-
30	Durai Pandi	23	M	4	3	+	-	-	+	-	N	N	N	N	+	-	-	-	-	-
31	Kathiresan	36	M	3	2	+	-	+	+	-	N	N	N	N	+	-	-	-	-	-
32	Balakamakshi	33	F	5	3	+	-	+	+	-	N	N	N	N	+	-	-	-	-	-
33	Priya	30	F	4	3	-	-	-	+	+	N	+	-	N	-	-	-	+	-	-
34	Ponnammal	43	F	3	2	-	+	-	+	-	N	N	N	N	-	-	-	+	-	-
35	Jamuna	49	F	4	1	-	+	+	+	-	N	N	-	N	-	-	-	-	+	-
36	Mookkan	67	M	3	2	-	-	-	+	+	N	+	+	N	+	-	-	-	-	L
37	Poongodi	40	F	3	2	-	+	-	+	-	N	N	N	N	-	-	-	-	-	-
38	Sundaram	39	M	5	4	+	-	+	+	+	↑	+	+	N	-	-	+	-	-	L
39	Ganesan	50	M	4	3	+	-	+	+	+	N	+	-	N	+	-	-	-	-	-
40	Veerammal	35	F	5	4	-	+	-	+	-	N	N	-	N	-	-	-	-	+	-

Sl. No	Name	Age	Sex	SYMPTOMS					SIGNS		INVESTIGATIONS				PROCEDURE					
				Pain Abdomen		Fever	Previous Abdominal surgeries	Others	Tenderness	Mass Abdomen	LFT	USG Abdomen	CT Abdomen	others	Biopsy	Ascitic fluid	Abscess drainage	Appendicectomy	Adhesiolysis	**Solid organ pathology (Liver,Colon,Pancreas)**
				Duration in months	No. of attacks															
41	Velammal	65	F	6	3	+	-	+	-	-	N	N	N	N	+	-	-	-	-	-
42	Abdul Sardar	58	M	4	3	+	-	+	+	-	N	+	+	N	-	-	+	-	-	L
43	Kannammal	42	F	5	3	+	-	+	+	-	N	N	N	N	-	-	+	+	-	-
44	Mariselvam	41	M	4	2	-	-	-	+	-	N	N	+	N	-	-	-	-	-	-
45	Pandiammal	32	F	4	3	-	+	-	+	-	N	N	-	N	-	-	-	-	+	-
46	Andammal	57	F	4	3	-	+	-	+	-	N	N	N	N	-	-	-	-	+	-
47	Maheshwari	42	F	5	3	-	+	-	+	-	N	N	N	N	-	-	-	-	+	-
48	Renuga	48	F	4	2	+	-	-	+	-	N	+	-	N	-	-	-	+	-	-
49	Durai	22	M	8	5	-	-	-	+	-	N	+	-	N	-	-	-	-	-	-
50	Senthil	26	M	9	6	-	-	-	-	-	N	+	+	N	+	-	-	-	-	C
51	Rakkammal	70	F	4	2	+	-	-	+	-	N	N	N	N	-	-	-	+	-	-
52	Subramani	60	M	5	3	-	-	-	+	+	N	+	+	N	+	-	-	-	-	C
53	Ayyanar	15	M	4	3	+	-	+	+	-	N	+	-	N	-	-	+	-	-	-
54	Lingeshwaran	22	M	3	2	+	-	-	+	-	N	+	-	N	+	-	-	-	-	-
55	Rani	38	F	4	3	-	-	+	-	+	N	+	+	N	+	-	-	-	-	C
56	Boominathan	20	M	5	3	-	-	-	-	-	N	+	-	N	-	-	-	-	-	-
57	Shakthi	36	F	3	2	-	-	-	+	-	N	N	N	N	-	-	-	-	-	-
58	Mohammed	39	M	3	2	+	-	+	+	+	N	+	-	N	-	-	-	+	-	-
59	Muthupandi	27	M	6	2	-	-	-	-	-	N	+	-	N	-	-	-	-	-	-
60	Anandham	37	F	5	4	-	+	-	+	-	N	N	N	N	-	-	-	-	+	-

Sl. No	Name	Age	Sex	SYMPTOMS					SIGNS		INVESTIGATIONS				PROCEDURE					
				Pain Abdomen		Fever	Previous Abdominal surgeries	Others	Tenderness	Mass Abdomen	LFT	USG Abdomen	CT Abdomen	Others	Biopsy	Ascitic fluid	Abscess drainage	Appendicectomy	Adhesiolysis	**Solid organ pathology (Liver,Colon,Pancreas)**
				Duration in months	No. of attacks															
61	Kathirvel	35	M	6	8	+	-	+	-	-	N	N	N	N	+	-	+	-	-	P
62	Mottaiyan	45	M	3	3	+	-	-	+	-	N	N	-	N	-	-	-	+	-	-
63	Sivarani	36	F	4	4	-	+	-	-	-	N	N	N	N	-	-	-	-	+	-
64	Thangamani	61	F	3	2	-	-	-	+	-	N	N	N	N	-	-	-	+	-	-
65	Priya	25	F	4	3	-	-	-	+	-	N	N	-	N	-	-	-	-	-	-
66	Kasi	18	M	3	2	-	-	-	+	-	N	N	-	N	-	-	-	-	-	-
67	Bagavathy	31	F	3	3	+	-	-	+	-	N	N	-	N	-	-	-	-	-	-
68	Balakrishnan	25	M	3	2	+	-	-	+	-	N	N	-	N	-	-	+	+	-	-
69	Muthupillai	13	F	3	1	-	-	-	+	-	N	N	-	N	-	-	-	-	-	-
70	Nagarani	27	F	3	4	-	+	-	+	-	N	N	+	N	-	-	-	-	+	-
71	Kasthuri	20	F	3	2	-	-	-	+	-	N	N	-	N	-	-	-	-	-	-
72	Mathialagan	15	M	5	3	-	-	-	+	-	N	N	-	N	-	-	-	-	-	-
73	Tamilselvi	28	F	3	3	-	+	+	+	-	N	+	+	N	-	-	-	-	-	+
74	Karthiga	21	F	5	4	+	-	-	+	-	N	N	-	N	-	-	-	+	-	-
75	Panchavarnam	31	F	3	3	+	-	+	+	-	N	N	-	N	-	-	-	-	-	-
76	Jothilakshmi	26	F	5	3	-	+	-	+	-	N	N	-	N	-	-	-	-	+	-
77	Balakrishnan	13	M	4	2	-	-	-	+	-	N	N	N	N	-	-	-	-	-	-
78	Thangapandi	27	M	6	3	-	-	+	-	-	N	+	-	N	-	-	-	-	-	+
79	Ramu	21	M	6	3	+	-	+	-	-	N	N	-	N	+	+	-	-	-	-
80	Rojabegum	32	F	3	2	-	-	-	+	-	N	N	N	N	-	-	-	-	-	+